

DOCUMENT RESUME

ED 293 703

SE 049 054

AUTHOR Azzolino, Agnes
TITLE Math Games for the Young Child.
PUB DATE 85
NOTE 92p.; Some drawings may not reproduce well.
AVAILABLE FROM Mathematical Concepts, Inc., 85 First Street,
Keyport, NJ 07735-1503 (\$8.60 plus \$1.40 shipping and
handling).
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)
-- Guides - Non-Classroom Use (055)
EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Class Activities; *Concept Formation; Early
Childhood Education; *Educational Games; Elementary
Education; *Elementary School Mathematics; Geometric
Concepts; Instructional Materials; Learning
Activities; Mathematics Education; *Mathematics
Instruction; Number Concepts; *Young Children

ABSTRACT

This is a textbook of games for children of ages two through seven. In each section, games are listed from the basic to the more sophisticated and advanced. The book contains sections addressing: (1) counting and counting games; (2) travel games; (3) card games; (4) board games; and (5) games and activities with other things. (PK)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED 293703

MATH GAMES FOR THE YOUNG CHILD

AGNES AZZOLINO

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

- ☒ This document has been reproduced as received from the person or organization originating it.
- ☐ Minor changes have been made to improve reproduction quality.
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Agnes
Azzolino

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

SE 049054

MATH GAMES FOR THE YOUNG CHILD

Agnes Azzolino

MATH GAMES FOR THE YOUNG CHILD

Agnes Azzolino
Assistant Professor of Mathematics
Middlesex County College
Edison, NJ 08818-3050

Copyright 1985, Agnes Azzolino

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the Publisher.

10 9 8 7 6 5 4 3 2 1

MATHEMATICAL CONCEPTS, Inc.
85 First Street
Keyport, NJ 07735-1503

Printed in the United States of America.

To MICHAEL ANTHONY VINIK,
an exceptional game player, game creator, individual,
and, obviously my son.

MATH GAMES FOR THE YOUNG CHILD

TABLE OF CONTENTS

Table of Contents.....	vii
How Many Would You Like?.....	ix
Once Upon A Time.....	x
Playing Math Games With A Young Child.....	1
Counting and Counting Games.....	4
How Many Would You Like?.....	6
Counting Till You Get There	8
Show Me and Stones On My Legs.....	11
Show Me.....	12
Show Me With Coins.....	15
Counting By... ..	20
Counting Backwards.....	21
Travel Games.....	22
Stones on My Legs.....	23
How Much is...?	25
What Comes After/What Comes Before.....	28
What's The....?	30
I'm Thinking Of A Number.....	33
Card Games.....	36
Sumthing Else	37
War.....	40
Beat The Tens.....	43
Done; For 2,3, or 4.....	45
Board Games	
What Do You Give To The Child Who Has	
Everything?.....	48
Forward and Backward.....	51
Clocks; Fill The Blank.....	54
Bingo.....	56
Games And Activities With Other Things.....	57
What Would You Like to Buy?	59
Juke Box Game.....	60
Measuring Tape Game.....	63
A Calculator Game.....	66
Magic Line.....	68
I Want You to Draw... ..	70
Activities In Bathtubs.....	76
Tables	
Topic and Level Chart.....	80
Games to Play After and With.....	82

HOW MANY WOULD YOU LIKE?

"How many would you like?"

"Three red ones, and two green ones, please."

A confident three-year-old Michael counts out three red milk bottle tops and two green ones, slides them across the table to his mother saying, "Here you are."

She stops grading her papers for a moment, receives the tops and drawing them to her side of the table says, "Thank you."

He says, "You're welcome. How many would you like?"

"Two red ones, three green ones, and one blue one please," responds the mother as she continues grading papers.

Michael sorts through his mass of plastic milk bottle tops repeating sometimes out loud and sometimes to himself, "two red ones, three green ones, and one blue one." As he does this he creates a pile of tops then announces, "Here you are," pushing the colored tops to his mother.

Mommy glances at the tops. "I'd also like six blue ones, please."

The boy checks his supply and says, "I don't have that many."

"How many do you have left?"

"Four."

"O.K., I'll take those."

Mike passes her four blue tops.

"Thank you," says Mommy. "Now, how many would you like?"

"Oh," sighs Michael, "three red ones, maybe."

Mommy slides three red tops to her son, says, "Here you are," smiles, returns to her papers, and awaits further instructions from her son.

ONCE UPON A TIME

Once upon a time, my son and I were speaking to a group of parents and teachers about the math games we played. After the talk, a man from the group asked me to write a book about our games, and so this book was born.

This is a textbook of games for children of ages two through seven. Though reading is easy and hopefully entertaining, it is still a textbook. Scanning or skimming in this book may be accomplished by using the game summaries at the beginning of each game. These should also be useful to both the classroom teacher and the parent as guides and quick reference for game play.

In each section, games are usually listed from the basic to the more sophisticated and advanced. Games within a section or from different sections should be played during the same time period. Charts at the end of the book will help you to decide which games to play at a given time.

Use your own judgement as to readiness of your child or your class for the playing of a particular game. No one knows a class's ability or readiness better than the teacher. No one knows a child's ability or readiness better than a parent. Trust your judgement-- indicators are listed with each game to help you make the right decision. Back off, simplify, modify, and improve upon a game but always provide success and some challenge. If the words I use in the text don't seem right for your child, don't use them. Use your own. Make the game your own.

These games can provide initial and continual mathematical experience for children as young as two. Through this "early" exposure, children who regularly play the games will be able to demonstrate skills normally mastered at a later time by children who have not had mathematical experiences such as these.

If the children in your life grow through the playing of these games, my fairy tale will have a happy ending.

Agnes Azzolino

Keyport, NJ

July 1985

Special people enter each of our lives and we rejoice in the support, examples, advise, or even the scoldings they give us. Such people abound in my life: my son, my parents, my family, and my friends.

I'd like to thank these special people for being there. In particular, I wish to thank a wonderful friend-- Sue Ross--for her work in preparing this manuscript for publication and the special individuals in the Department of Printing, Publications and Mail Services of Middlesex County College: Henry Van Scoy, Carlos Riveria, Eileen Davis, Olga Hrantko, Joe Boyle, Mary Lou Eickert, Terry Karrick, Peggy Johannas, and Brian Peterson for all their help now and in the past years.

August 1987

PLAYING MATH GAMES WITH A YOUNG CHILD

Children are ready considerably before the age of five to play and think mathematically. This collection of games is one attempt to make this play enjoyable and meaningful for the parent, or adult, or teacher, and the child.

HOW MANY WOULD YOU LIKE? is the first math game my son, Michael, and I ever played. Michael has played it with other adults in the family. In addition to the mathematics it's taught, it's provided precious, peaceful, one-on-one time for him and anyone choosing to play with him. If you have never learned to play with a young child, playing HOW MANY WOULD YOU LIKE? is a good first step for you to take.

Of course, Mike didn't start playing with requests for four of one kind, two of another and one of yet another kind of thing. Shortly after Michael was two years old, he and his grandfather were sitting on the living room sofa with a handful of play money from some old game. His Grandpa, while in the act of watching tv, turned to Michael and said, "How many would you like?"

Since Michael only knew the words one and two and probably didn't understand completely their meaning, he answered, "One, please." They played, and the game was born.

This game illustrates some important points.

ONE PLAYS A GAME TO HAVE FUN. If Mike weren't enjoying himself, play wouldn't have continued. If Grandpa weren't enjoying the closeness it brought him, the giving it demanded of him, and the satisfaction in seeing his grandson grow as they played, play wouldn't have continued.

FREE PLAY WITH GAME PIECES MAY BE NECESSARY BEFORE A GAME BEGINS. A teacher knows that until the children have had the opportunity to handle, feel,

and see new equipment, activity with it will ensue. When new material is used or when a new game is played, leave time for the items to be handled and examined. Permit play with the material in ways other than its designed use if this is at all possible. Let the child explore and create.

GIVE A CHILD TIME TO ANSWER!!!! It takes children longer to think through something than it takes for adults. Young children often repeat a phrase over and over again: they're still thinking the same thing, we're annoyed by the repetition.

ADULTS MAY NEED SOMETHING ELSE TO DO WHILE PLAYING A GAME WITH A CHILD. When Grandpa and Mike played the game, Grandpa watched tv. When Mike and Mommy played the game, Mommy graded papers. Many adults claim, "I can't play games with little kids. It's just too boring, they go too slow." These people CAN play games with young children: they just haven't realized they also need to do something else at the same time.

Having the adult concentrate on more than the game may make the playing more enjoyable for both players. The child has more time to respond and the adult is distracted enough to decrease his or her playing ability: this makes the game more evenly matched. One should be careful, however, that the adult does not spend too much time on the other activity. This could be uncomfortable for both players.

LET THE CHILD INITIATE GAME PLAYING ACTIVITIES. At our house, Mike is generally the one who wants to start playing a game. A game isn't played when there are swings to swing upon, dirt to dig, or bikes to ride: rather, games are played when it's wet and cold outside or when the dirt's been dug and the body tires.

PLAY A QUIET GAME AT A QUIET TIME. These math games can be enjoyed at day's end, before getting ready for bed, when having a late snack, or while the adult is doing some place-restrictive work like grading papers, peeling potatoes, or watching a video.

DON'T PLAY A GAME EVERY CHANCE YOU GET. Traveling in a car, plane, or train can be the perfect time for playing games but it may also be the perfect time for relaxing and not interacting.

THE ADULT AND CHILD ARE EQUALS WHEN PLAYING A GAME. THEY ARE BOTH PLAYERS. There needn't be a teacher and a student when playing a game. There may be an expert and a novice, but, each remains just a player. This equality may be uncomfortable for the adult for a time, but it gives the child a chance to be adult.

SHIFT ROLES WHILE PLAYING A GAME. If there is more than one role a player can assume during a game, the child should have a chance to play each role when ready. Let your child keep score. Let him or her be the banker. It takes longer to play, but the play is very valuable.

MAKE A GAME YOUR OWN!!! These games are meant as workable games in themselves, but also as starting points for your own unique variations or set of rules. Make the game enjoyable for the players or don't play it. If the game is a flop the first time you play it, don't play it for awhile. Wait, leave time for growing and learning and then try it or a variation again. If something is not a challenge or pleasure to play, don't make it part of YOUR collection of games. GAMES ARE FOR ENJOYMENT.

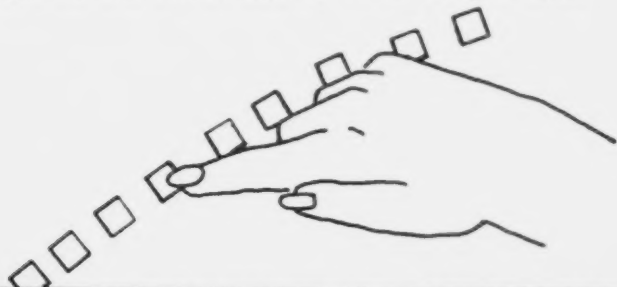
COUNTING AND COUNTING GAMES

Of all the math games in this book, counting games are the most basic and the most important. The skills they teach and the knowledge they require are important in almost all the other games and in much of the arithmetic or mathematics curriculum of our schools.

This is where it begins.

The games have been arranged in approximate order of difficulty. HOW MANY WOULD YOU LIKE? is probably the easiest and should be played often before games like SHOW ME or STONES ON MY LEGS are attempted. HOW MANY WOULD YOU LIKE? requires concrete objects. This is a very important requirement for a young child. Before the counting games are attempted, a child needs to begin to count. I certainly don't mean by himself or by herself, I mean by watching or helping an adult count. Children learn the words one, two, and three, and so on by hearing other humans say them and by watching how they are used. Use numbers often when children are about. Children understand words and ideas long before they themselves begin to speak. Count so they are able to see and hear you count.

When a child does begin to count he or she will not be able to keep track of what's been counted. The adult must do this job. Help the child by pointing to an item as the child counts it or as you both

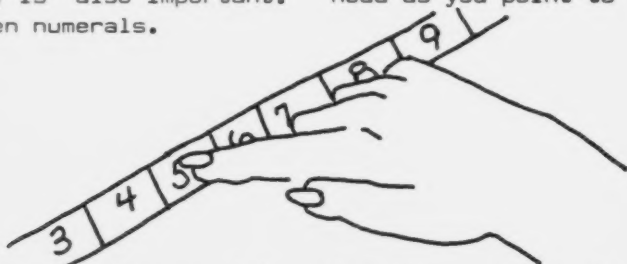


count it. Even with items lined up, a young child will not be able to count them alone. In addition to pointing and counting, try moving the piece to a new



pile once it's been counted. Both methods are important for a young child to see.

Counting out loud when numbers are written sequentially is also important. Read as you point to the written numerals.



Counting practice may take place in games or in normal daily life. Often an adult teaches a child to speak by pointing to something, naming it, and using this name when speaking to the child. A child can learn to count in exactly the same manner.

Very little counting practice is necessary for the game of HOW MANY WOULD YOU LIKE. The concepts of one and two are all a child needs to play this first math game.

HOW MANY WOULD YOU LIKE?

HOW MANY WOULD YOU LIKE?

TOPIC and LEVEL: Counting: 8

PLAY AFTER:

PLAY WITH: COUNTING TILL YOU GET THERE

Key Requests:

*"May I have one?"

*"How many would you like?"

*"I'd like all the pieces you have. How many do you have?"

*"I'd like two red ones and four blue ones, please."

*"I'd like two red ones, three yellow ones, and four pink ones, please."

*"What would you like to give me?"

This game requires two players and a collection of things. The type of toy or item depends on the child's age. As play proceeds, the type of question will become more sophisticated. As a starting point, let's give the Child, age two, all the pieces.

The Adult asks, "May I have one?"

The Child checks the collection and may hand over the requested one piece. If so, play continues with the Adult asking, "May I have one?" or "May I have two?" If not, the Adult might give the Child more time to respond or repeat the question, "May I have one?"

If the exchange still doesn't occur, the Adult might say, "Thank you, this is one," take a piece and then continue play by asking, "May I have one, please?"

Let's change the game slightly.

We'll give the Child all the pieces, but this time the Child asks, "How many would you like?" or just, "How many?"

The Adult responds: "Two, please."

The Child counts the required pieces and hands them to the Adult who then asks, "How many would you like?"

The Adult responds with: "One, please," or "Three, please."

If the Child responds with the correct number, play continues. If not, the Adult might give the Child more time, or help the child to count the required pieces.

This kind of simple play: "How many would you like?"; "Two please"; "How many would you like?"; "Six, please"; ... "How many would you like?"; "Three, please" may continue for some time. Eventually, the Child asks, "How many would you like?" and the Adult responds: "I'd like all the pieces you have. How many do you have?"

With the completion of this turn, the Adult and Child have completely reversed roles. The player who once asked, "How many would you like?" now has the job of counting out the requested pieces. This is good. EACH PLAYER SHOULD LEARN AND PLAY BOTH PARTS AT SOME TIME. Role reversal is also good when it happens more than once in a playing session.

As the child develops, the requests for pieces change and the collection may include more than one kind of item. Players may say: "I'd like sixteen" or "I'd like two red ones and four blue ones, please" or "I'd like two red ones, three yellow ones, and four pink ones, please" or "What would you like to give me?"

COUNTING TILL YOU GET THERE

COUNTING TILL YOU GET THERE

TOPIC and LEVEL: Counting: 8, 1

PLAY AFTER: HOW MANY WOULD YOU LIKE?

PLAY WITH: HOW MANY WOULD YOU LIKE? COUNTING BY
TWO'S, COUNTING BY TEN'S

KEY INSTRUCTIONS:

*The Adult: "YOU START counting." (The
Adult says the even numbers.)

*The Adult coaches by raising fingers.

*The Adult emphasizes the repetition of one,
two, three through nine.

*The Adult emphasizes the TWENTY in TWENTY-
two, TWENTY-three...

*The Child says the even numbers.

Even before a child understands the numbers he or she is reciting, counting is a very good activity. COUNTING TILL YOU GET THERE is an excellent travel game, but it's been included in counting games because of its importance as a beginning math game. When traveling, one won't generally be working with concrete objects, so the counting here reinforces the periodicity of numbers, the repetition of the same sequence of sounds in number names, and the abounding number patterns. COUNTING TILL YOU GET THERE should be paralleled at home with concrete counting experiences and games of HOW MANY WOULD YOU LIKE?.

When counting with a very young child, the adult should count the even numbers. For example:

The Adult and Child are seated in the front seat of a moving car.

The Child: "Mommy, how far is it to Grandma's

house?"

The Adult: "It's about 10 miles, Heidi. It'll take 10 minutes. Would you like to count to see how long it takes?"

The Child: "O.K."

The Adult: "YOU START counting, Heidi."

The Child: "One."

The Adult: "Two."

The Child: "Three."

The Adult: "Four," Silence prevails. The Child is thinking. Helping her probably isn't necessary.

The Child: "Five."

The Adult: "Good! Six."

The Child: "Seven."

The Adult: "Eight."

Silence. And continued silence. The Adult holds up nine fingers. The Child then counts them and says: "nine."

The Adult: "Good! Ten." (A first major counting hurdle is achieved.)

All this has probably taken three or four minutes. The Child may now say, "Let's do it again."

As a child becomes a better counter, the players would continue counting rather than return to the number one.

The Child: "Let's count, Mommy. One."

Then alternating: "Two." Three." "Four." with the Adult emphasizing the repetition of the one, two, three through nine pattern, every-ready for coaching by finger hints.

As the Child gets better, the emphasis shifts away from the one, two, three sound to the more sophisticated TWENTY, twenty-one, TWENTY-two, twenty-three, TWENTY-four, ... sound.

After time, with the Adult still controlling the counting by stating the even numbers, the repetition of the one through nine sequence and the sequence of twenty is joined by the thirty sequence and the forty sequence. These are more important patterns to hear and recognize.

As the Child's sophistication grows, she should assume the role of the counter of the even numbers. It is a more difficult job because at the even numbers of ten, twenty, thirty, the counting patterns

shift.

Learning to count takes a long time.

In the above example, the counting ended long before the trip. In practice, one may be counting at the time of arrival. Players may have counted all the way to two hundred fifty-one or four hundred or higher. Michael and I started these counting exercises when he was two and it took months to master counting through ten and then through twenty. Sophistication developed and we were able to count higher. Eventually we decided not to begin counting with one, but recorded the number on which we ended then used this as the starting place when we began counting again. By the time Mike was five, we'd counted through one thousand two hundred and never again bothered with the sequential counting: COUNTING BY TWO'S and COUNTING BY TEN'S had replaced it.

COUNTING TILL YOU GET THERE played by two people may be used to ready a child for COUNTING BY TWO'S and COUNTING BY TEN'S. When played by two young children and one adult it is more difficult. With older, more experienced children, COUNTING TILL YOU GET THERE is an excellent readiness activity for games like Buzz and Bang-- games in which numbers are omitted when counting.

SHOW ME and STONES ON MY LEGS

This pair of games forms a basis for written addition and subtraction. When playing, the child is adding or subtracting either using concrete objects or mental images of objects--important developmental activities.

The games reinforce each other. SHOW ME should be played a bit earlier than STONES ON MY LEGS but as skill is developed in one game or activity the child should also be playing the other game.

Because STONES ON MY LEGS is a mental game, it is included with the Travel Games. SHOW ME belongs here with the Counting Games.

SHOW ME

SHOW ME

TOPIC and LEVEL: Addition/Subtraction: B, I, A

PLAY AFTER: HOW MANY WOULD YOU LIKE?

PLAY WITH: STONES ON MY LEGS?

WHAT WOULD YOU LIKE TO BUY?

KEY QUESTIONS:

*The Adult says: "I'd like two red ones and one blue one."

*The Adult says: "How many pieces did you give to me?"

*The Adult says: "How many did you give me altogether?"

*The Adult says: "We could count them and write the answer down," and the Adult writes:
 $4 + 4 = 8$.

*The Adult says: "Show me five plus 2 more."

*The Adult says: "How much is 5 plus 2 more?"

As described above, SHOW ME involves answering addition and subtraction questions through counting. The SHOW ME games outlined here are of two kinds: a game with all items having equal value and a game with items of unequal value, specifically coins. The first version is the simpler so we'll start with it.

In summary, one player requests different numbers of colored pieces: the other player counts the required pieces. Players exchange places. Once each roll is mastered, the requester might ask for the total number of pieces exchanged or how many pieces remain.

READ THE STARRED PASSAGE ONLY IF YOU'D LIKE AN IDEA OF WHAT THE QUESTIONS MIGHT BE AND HOW THE EXCHANGE MIGHT PROCEED.*****

The Adult and Child have been playing HOW MANY

WOULD YOU LIKE? The Adult says, "I'd like two red ones and one blue one, please."

The Child collects the required pieces and passes them across the table then looks up for further instructions.

The Adult says, "Thanks, Alan, how many pieces did you give to me?"

The Child looks up and answers, "Two red ones and one blue one."

The Adult responds, "Yes, that's true. How many pieces is that all together?" returning the pieces one by one to the Child.

The Child is quiet. "Three."

"Good!" says the Adult. "Now, I think I'd like two blue ones and two red ones."

The Child sorts his stack and passes the requested pieces.

The Adult comments, "Thanks. How many did you give me altogether this time?"

The Child reflects then responds with, "Four."

The Adult Responds, "Good. Now will you please give me four red ones and five purple ones?"

The Child sorts the pieces and passes them across the table.

The Adult accepts the pieces and asks, "How many did you give me this time?"

"I don't know."

"Let's count them, then."

As the Adult touches and slides each piece from the existing pile to a new pile, each player counts out loud, "One, two, three, ..., nine."

The Adult remarks, "You gave me nine pieces."

Play continues. The Child's pile is exhausted and the Adult asks, "How many would you like?"

The Child responds, "I'd like five blues and three reds and four whites."

The Adult sorts through the pieces, collecting the requested pieces, then responds: "Here are the five blue ones," advancing this collection of five pieces to the center of the table; here are three red ones," pushing these as a group to the center of the table; "and here are four white ones, moving this group to the table's center also. "Let's count them to see how many there are altogether."

They count as the Child moves the pieces. "There are twelve pieces," announces the Child. Let's skip a few plays and look in when the Child has all the pieces.

The Child asks, "What colors do you want?"

The Adult answers, "Oh, I don't care. Red and blue."

The Child responds with appropriate pieces then announces, "That's five altogether."

The Adult smiles and says, "That's right. Show me four pieces and four more pieces. They could all be red."

The Child sorts out two groups of four pieces and presents them to the Adult.

The Adult responds, "Thanks. That's right. How many are there altogether?"

The Child answers, "I don't know. Maybe we can count them?"

The Adult answers, "Yes, let's do that and we can even write the answer down if you'd like."

"Yes."

The pieces are counted and the Adult writes:

$4 + 4 = 8$.*****

Once the game has been played a few times, the questions or requests will be abbreviated to, "Show me five plus two more," and, "How much is five plus two more?" Sophistication occurs with more and larger addends and with quicker responses.

More addition facts may also be added to the Child's list. Some children enjoy collecting or keeping just about anything. These equations are no exception.

Counting practice may take place in games or in normal daily life. Often an adult teaches a child to speak by pointing to something, naming it, and using this name when speaking to the child. A child can learn to count in exactly the same manner.

Very little counting practice is necessary for the game of HOW MANY WOULD YOU LIKE? The concept of one and two is all a child needs to play this first math game.

SHOW ME WITH COINS

SHOW ME WITH COINS

TOPIC and LEVEL: Counting: A

Addition/Subtraction: A

PLAY AFTER: HOW MANY WOULD YOU LIKE?, WAR, COUNTING BY

PLAY WITH: STONES ON MY LEGS, COUNTING BY, WAR, WHAT WOULD YOU LIKE TO BUY?

KEY INSTRUCTIONS AND QUESTIONS:

*A penny and nickel
have been placed on a
sheet of paper which
has been labeled as
shown.



= 1¢



= 5¢

*Show me how to fill this
box with money worth 5 pennies.

*Can you show me five cents without
giving me a nickel?

*Show me two different collections of
coins each worth 6 cents.

*Show me seven cents.

*Show me ten cents.

*Show me twenty-six cents.

*Tell me how much money I have here.

*Show me what's left when I have 5 cents and
I spend 2 cents.

*Show me the change if I buy ten cents worth
of candy with 25 cents.

*How much money will you have if I give you
2 dimes, 3 nickels, and 1 penny?

Often, children are initially taught to count money in first or second grade in a large group setting. One-on-one instruction may introduce and teach topics and skills much earlier than large group

instruction. Teaching counting with coins is an example of the phenomena.

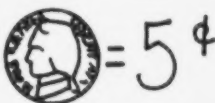
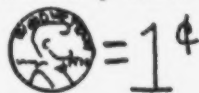
Before using coins as pieces having different value, it is important to establish the idea that one thing may have more or less value than one other thing. This is not an easy concept. If your child does not understand this idea, do not play SHOW ME WITH COINS.

With a young child, I suggest working with only nickels and pennies at first. With an older child, one might try other coins. Playing COUNTING BY FIVES or COUNTING BY TENS also provides good background activity prior to work with coins, but this is not absolutely necessary.

Work with coins is difficult for the young child. Caution should be taken not to rush the issue--not to play with coins too soon. Here we will examine two different approaches to SHOW ME WITH COINS as played with a young child. The first way is a more academic, less play-oriented, approach. You may wish to explore both ways.

A penny and a nickel have been placed on a sheet of paper which has been labeled as shown at the right.

If your child or children do not know the symbols "1" and "5", the game WAR might be played before and with SHOW ME WITH COINS.



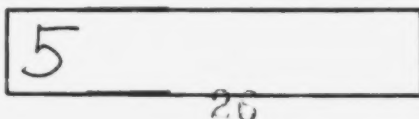
Also on hand is a pile of coins containing both pennies and nickels.

The Adult requests, "Show me how to fill this box with money worth five pennies," and draws the picture at the right.



The Child picks a nickel from the pile and places it in the rectangle.

"Good," remarks the Adult, "now fill this," drawing the figure below.



"Good." The Adult next draws different rectangles one which can enclose exactly 6 pennies and the other which can enclose exactly two coins--a penny and a nickel, then asks the Child to fill the rectangles with money worth 6 cents.

This variation of the game is good because the child can see that more than one way of having six cents is possible.

The second variation of the game of SHOW ME WITH COINS is a less academic way of achieving the same results.

Here are the kinds of questions which might be asked.

"Show me five cents."

"Can you show me five cents without giving me a nickel?"

"Can you show me two different collections of coins each worth 6 cents?"

"Could you use a nickel to make a pile with 6 cents."

At first, when playing the game of SHOW ME, the Adult will, of necessity, be the requester. Role reversal is not as important in the beginning of this game as in HOW MANY WOULD YOU LIKE?, but role reversal should occur when possible.

As the child becomes more proficient, questions will gradually change from

"Show me seven cents," and

"Show me ten cents," and

"Show me twenty-six cents," and

"Please give me smaller coins for this quarter," and

"Tell me how much money I have here," and

"Tell me how much money you'll have if I give you one dime and two pennies," and

"Show me what's left when I have five cents and spend two cents," and

"Show me the change if I buy ten cents worth of candy with twenty five cents," and

"Give me change for a dollar," and

"Tell me how much money you'll have if I give you two dimes, three nickels, and one penny."

Playing SHOW ME uses concrete objects to help build skills used in STONES ON MY LEGS and addition

and subtraction without the use of concrete objects or mental images. Each time you play these games, ask questions the child's heard before, spend time with questions of the child's current level of sophistication, and reach a bit beyond what you think the child can answer. You may be pleasantly surprised.

COUNTING BY

COUNTING BY

TOPIC and LEVEL: Counting: I,A

PLAY AFTER: COUNTING TILL YOU GET THERE

PLAY WITH: COUNTING TILL YOU GET THERE and
COUNTING BACKWARDS

Key Instructions:

*Emphasize the even numbers when COUNTING
TILL YOU GET THERE.

*Count some numbers loudly, others softly.

*Adult gives hints as they count: 12, 14,
16, 18, (softly) 19, 20, 22

COUNTING BY is really a group of games. Players simply count by twos, tens, fives, fours, hundreds, etc. These games should be played after games like COUNTING TILL YOU GET THERE. They are building blocks for multiplication and pattern recognition.

In COUNTING TILL YOU GET THERE the emphasis the Adult has made on the sounds of twenty, thirty, and so on, has prepared the child to count: ten, twenty, thirty, forty. He or she is ready for COUNTING BY TENS. Emphasis on the even numbers prepared the way for COUNTING BY TWOS.

Here's how the game of COUNTING BY TWOS may be introduced.

Adult: "I have a good idea. Let's count some numbers loudly and some numbers very softly. I'll start, and whispers, "one."

Child in a normal voice: "two."

Adult whispers, "three."

Child says in a normal voice, "four."

The players continue, then may exchange roles.

After playing this game a few times or perhaps more than a few times, the players would try something like the following.

Child: Let's count by twos.

Adult: O.K.

Child: Two.

Adult: Four.

Child: Six.

Adult: Eight.

Child: Ten.

Adult: Twelve.

The Child is silent. The Adult whispers, "Thirteen."

Child: "Fourteen."

I believe most elementary school students find the two, five, and ten times tables the easiest because they have heard this sort of counting out loud. I think this counting will also make the four, seven, or any times table easier for people to complete.

As with COUNTING TILL YOU GET THERE, I believe that adult and child should alternate saying the number out loud. Using as many senses as possible has been shown to be an important teaching strategy. Before reading an analog display clock, a clock with hands rather than digits, COUNTING BY FIVES is an important skill builder. It is important for the child to do counting out loud, as in COUNTING TILL YOU GET THERE, before and while COUNTING BY FIVE is played. These counting games may be played even while the child is older and studying the times tables or multiplication in school.

COUNTING BACKWARDS

COUNTING BACKWARDS

TOPIC and LEVEL: Counting: I, A

PLAY AFTER: COUNTING TILL YOU GET THERE

PLAY WITH: COUNTING TILL YOU GET THERE,
COUNTING BY...

Key sequences:

*The Adult or Child or both the Adult
and Child: "Ten, nine, eight."

*"Twenty, nineteen, eighteen."

*"One hundred, ninety-nine, ninety-eight."

*"One hundred, ninety, eighty, seventy."

This counting game is another game which is elementary yet important, and, perfect for playing while traveling. It can help a child in the ordering of numbers or with one model of subtraction. COUNTING BACKWARDS is not nearly as easy as counting in the normal fashion. Even adults may have to think when counting backwards.

An introduction to the game of COUNTING BACKWARDS is included in ACTIVITIES IN THE BATHTUB.

An elementary game might start with Adult and Child alternately saying: "Ten."

"Nine."

"Eight."

Or, both saying, "Ten, nine, eight."

A more advanced game might begin with "Twenty, nineteen, eighteen," or with "One hundred, ninety-nine, ninety-eight."

Games which should also be played include sequences like "One hundred, ninety, eighty, seventy," or "twenty, eighteen, sixteen."

The game helps reinforce the order of numbers and prepares the child to answer some tricky questions in the game of WHAT'S THE ...? as in "what's the number before seventy-four?"

TRAVEL GAMES

One of the best times to play math games with a young child is while riding in a confined space. In a car, an adult can concentrate on the road and still converse with a child passenger. Since the child should be using a seat belt, active play is not appropriate, so a quiet game is perfect. Travel by train, or plane, also provides this time: use it to the child's advantage.

Though the opportunity exists, DON'T PLAY A GAME EVERY CHANCE YOU GET. Traveling can be boring and playing these games may be tempting. Resist sometimes. Sing, talk, don't just play math games. Rhyming games, guessing games, and many other mental activities are appropriate. But, when you do choose to play, or even better, WHEN YOUR CHILD CHOOSES TO PLAY, enjoy!

Of the games collected in this section, there are really only two different games. STONES ON MY LEGS, HOW MUCH IS ...?, WHAT COMES AFTER ...?, and WHAT'S THE ...? are question and answer games using addition, subtraction, number order, and mathematical terminology as vehicles for mental problem solving and computation drill. The different names emphasize different levels of difficulty and types of problems. I'M THINKING OF A NUMBER, the other game type, teaches number order and question asking.

Each of these games can be enjoyable and valuable but care must be taken not to push a child too quickly or hard. DON'T PLAY A GAME UNTIL A CHILD IS READY.

STONES ON MY LEGS

STONES ON MY LEGS

TOPIC and LEVEL: Counting: A

Addition/Subtraction: B, I

PLAY AFTER: HOW MANY WOULD YOU LIKE?, SHOW ME

PLAY WITH: SHOW ME

Key Questions:

*The Adult: "How much is two plus two more?"

*The Adult: "How much is one plus one plus one?"

*The Adult: "How many stones would you have if I put five stones here," placing a hand on the Child's left leg, "and four stones here," placing a hand on the Child's right leg.

*"How much is six plus two?" and "how much is two plus six?"

This is an addition game played without concrete objects. It can and should be played before a child adds with pencil and paper and also at times when pencil and paper are not available.

For the young child, it is a companion game to SHOW ME, but STONES ON MY LEGS is definitely the more difficult.

The dialogue below takes place on a long plane ride. The Child is a young five year old who has played SHOW ME.

The Adult: "Aprila, how much is two plus two more?"

The Child: "Four."

The Adult: "How much is one plus one plus one?"

The Child thinks, then replies, "Three."

The Adult: "How many stones would you have if I put five stones here," placing a hand on the Child's

left leg, "and four stones here," placing a hand on the Child's right leg.

The Child is silent, then asks, "Nine?"

The Adult: "That's right. You're pretty good at this game. How much is six plus two more?"

The Child: "Put the stones on my legs."

The Adult places a hand on the Child's right leg saying, "Six," then places a hand on the Child's other leg saying, "two."

The Child: "Eight."

Until a child knows well the addition facts or understands that numbers may be added in any order, "how much is six plus two?" is an easier question than "how much is two plus six?" Both questions should be asked.

HOW MUCH IS ...?

HOW MUCH IS ...?

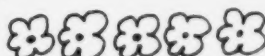
TOPIC and LEVEL: Addition/Subtraction: I, A

PLAY AFTER: HOW MANY WOULD YOU LIKE?, SHOW ME,
STONES ON MY LEGS

PLAY WITH: STONES ON MY LEGS

Key Questions:

*How many are ...



*How much is 2 plus 3?

*How much is 7 minus 1?

*How much is 4 plus 8 plus 1?

*How much is 5 million plus 2 million?

*How much is four dollars plus two dollars?

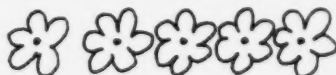
*How much is ten cents plus two cents plus
five cents?

*How much is one half plus one half?

*How much is three more than two?

The types of questions asked in HOW MUCH IS ...?
include:

1. How many are ...



2. How much is 2 plus 3? How much is 7 minus 1?

3. How much is 4 plus 8 plus 1?

4. How much is 5 million plus 2 million?

5. Others

Types 1 and 2 need no explanation.

Types 3 and 4, I recommend highly and prefer this
type of question even for older children because men-
tal computation of this sort is so important.

Type 3 includes questions involving more than two
numbers. Questions range from "how much is two plus
one plus one more," (which is a difficult question in

itself), to "how much is one plus one plus one" to "how much is five plus four, then, take one away from this?"

If a child says he or she doesn't know the answer, try STONES ON MY LEGS and slowing down the speed with which the question is posed before you try doing any sort of explanation or forgetting about that kind of question.

"How much is five million plus two million?" is typical of a lovely group of questions. Listen.

The Adult: "How much is five plus three?"

The Child: "Eight."

The Adult: "How much is ten minus one?"

The Child: "Nine."

The Adult: "How much is two hundred plus three hundred?"

The Child: "Five hundred, maybe."

The Adult: "That's right. How much is four hundred plus three hundred?"

The Child: "Seven hundred."

The Adult: "Good. How much is five million plus three million?"

The Child: "Eight million?"

The Adult: "That's right."

The Child is quite pleased with herself.

The Adult: "How much is nine million plus two million?"

The Child: "Eleven million." ...

The Adult: "How much is four dollars plus two dollars?"

The Child: "Six dollars."

The Adult: "How much is nine dollars minus three dollars?"

The Child: "Six dollars." ...

The Child: "How much is three dollars plus two dollars plus three dollars?"

The Adult: "Eight dollars."

The Child: "How much is ten cents plus two cents plus five cents?"

The Adult: "Seventeen cents."

If a child asks a question he or she can't answer, don't be surprised. One might explain the

problem through rearranging the addends or the use of concrete objects or mental images, such as stones, or one might offer the child a calculator. Either is desirable.

Other questions, as identified by type 5, take two separate forms: "How much is one half plus one half?" and "How much is three more than two?" THESE ARE NOT REALLY QUESTIONS FOR THE YOUNG CHILD, but rather for a child who has played games like FILL IT UP or has develop[ed] an extensive vocabulary.

"How much is one-half plus one-half?" or "how much is one-fourth plus one-fourth?" are really hard questions for a young child. Don't try them as part of a mental arithmetic game unless a concrete experience foundation has proceeded it and has been successful.

Children may gain a familiarity with fractions through measurements of time: two Mr. Rogers (half-hour shows) are as long as one Knight Rider (an hour-long show); measurements of money: two half-dollars have the same value as one dollar; or, more likely, four quarters have the same value as one dollar; or measurements of amount: a pile of four things has only half as many things as a pile of eight things. A child's age is very important to him or her. Try using terms like five and one-half, five and one-quarter, five and three-quarters, or even five and one-twelfth or five and seven-twelfth when teaching or discussing a child's age.

Of course, encounters with the use of fractions will only become valuable examples if, as they occur, some adult takes the time to explain the meaning of the words or the examples and is prepared to answer the questions later arising from the experiences.

Questions like: "how much is three more than two?" or, "how much is five bigger than seven?" or, "how many things are in two piles of six things?" require knowledge of the phrases "is five bigger than." These ideas and questions may be considered by some young children, but most young children will not find them understandable or entertaining. It is much better to leave a child with positive experiences than to frustrate him or her with questions clearly too difficult to answer.

WHAT COMES AFTER/ WHAT COMES BEFORE

WHAT COMES AFTER/ WHAT COMES BEFORE

TOPIC and LEVEL: Counting: A

Families: I

Order: I, A

PLAY AFTER: COUNTING TILL YOU GET THERE, COUNTING
BACKWARDS

PLAY WITH: COUNTING TILL YOU GET THERE, COUNTING
BACKWARDS

KEY QUESTIONS AND INSTRUCTIONS:

*"You say a number, and I tell you the
number which follows:" (listed here in order of
difficulty)

*six

*twelve

*thirty-three

*"Now tell me what number comes before:"

*five

*thirteen

*twenty-seven

*fifty

The Adult: "Luis, I have a new game for us to
play."

The Child: "What is it?"

The Adult: "It's called WHAT COMES AFTER. You
say a number, and I tell you the number that comes
after it. If I tell you the correct number, I get to
say a number and you must tell me what comes after
it.

"If I say nine, you tell me that number that
comes after nine."

The Child: "Ten."

The Adult: "Right. Now you get to pick a

number."

The Child: "Six."

The Adult: "Seven. Am I right? Does seven come after six?"

The Child: "Yes. You go."

The Adult: "Twelve."

The Child: "Thirteen. Nineteen."

The Adult: "Twenty. Thirty-three."

The Child, with thought: "Thirty-four. Fifty-one."

The Adult: "Fifty-two. Hmm, ninety-nine."

The Child: "One hundred."

At a later time:

The Adult: "We could play a harder game if you'd like."

The Child: "O. K."

The Adult: "I say a number and you tell me the number that comes before it. Twenty-three."

The Child: "Twenty-two. Now is it my turn?"

The Adult: "Yes."

The Child: "Sixty-seven."

The Adult says, "Sixty-eight," then pauses.

The Child: "But, that comes after sixty-seven."

The Adult: "That means you get to go again. Maybe you should give me an easier number."

The Child: "O. K. Nine."

The Adult: "Eight. Thirteen."

The Child: "Twelve. Two."

The Adult: "Oh, Luis, that's too easy. One. You try this one: it's pretty hard. Fifty."

The Child with a large smile says, "Forty-nine."

This game can only be played after a child has gained facility with COUNTING TILL YOU GET THERE and some practice with COUNTING BACKWARDS.

WHAT'S THE ... ?

WHAT'S THE ... ?

TOPIC and LEVEL:

Counting: A

Order: A

Problem Solving: I, A

PLAY AFTER: COUNTING TILL YOU GET THERE, COUNTING BY,
COUNTING BACKWARDS, WHAT COMES BEFORE/ WHAT COMES
AFTER

PLAY WITH: COUNTING BY ... , COUNTING BACKWARDS,
WHAT COMES BEFORE/ WHAT COMES AFTER, I'M THINKING
OF A NUMBER

KEY QUESTIONS:

*What's the number that follows twelve?

*What's the number that comes next if I say:
10, 9, 8, 7?

*What's the number that comes next if I say:
36, 35?

*What comes after 22, 24, 26?

*What's the number that comes next if I say:
1, 3, 5?

*What's the next number when I say 300, 400?

*What's the number I'm thinking of: it's less
than 10 but bigger than 5?

*What's the number I'm thinking of:

*it's even and it's less than 4

*it's bigger than 16 but less than 18

*it's odd and less than 3

*it ends in five and is bigger than 20
but less than 30

*it ends in five and is bigger than 23
but less than 31.

Questions typical of this game follow. Each
question represents a different level of difficulty
or sophistication.

What's the number that follows twelve?

What's the number that comes before seventy-two?
What's the number that comes next if I say: 10,
9, 8, 7?

What's the number that comes next if I say: 36,
35?

What comes after 22, 24, 26?

What's the number that comes next if I say: 38,
36, 34?

What's the number that comes next if I say: 1,
3, 5?

*What's the next number when I say 300, 400?

*What's the number I'm thinking of: it's less
than 10 but bigger than 5?

*What's the number I'm thinking of: it's even
and it's less than 4?

None of these questions appears easy. They are
not easy questions to answer, but a child who plays
well COUNTING TILL YOU GET THERE, COUNTING BY ...,
COUNTING BACKWARDS, and WHAT COMES AFTER/ WHAT COMES
BEFORE should be able to answer many of them.

The questions involving decreasing sequences are
more difficult than questions involving increasing
sequences. Use these questions sparingly and only
with the more sophisticated child. They are advanced
games.

The last two questions also need a bit of explan-
ation. The first has more than one answer and should
be treated as a guessing game if the child is inex-
perienced with this type of question.

The Adult: "What's the number I'm thinking of:
it's less than 10 but bigger than 5?"

The Child: "Is it 6?"

The Adult: "No."

The Child: "Is it 8?"

The Adult: "Yes, you guessed it."

This type of question should be asked often be-
fore proceeding to the unique-answer questions listed
last. It is the most difficult type of question and
substantial time should be spent asking this type of
question both concurrently with and prior to playing
the game of I'M THINKING OF A NUMBER.

Questions of this last type are: What's the num-
ber I'm thinking of:

it's bigger than 16 but less than 18; or

it's odd and less than 3; or
it ends in five and is bigger than 20 but less
than 30; or
it ends in five and is bigger than 23 but less
than 31.

I'M THINKING OF A NUMBER

I'M THINKING OF A NUMBER

TOPIC and LEVEL: Order: A
Problem Solving: A

PLAY AFTER: COUNTING TILL YOU GET THERE, WHAT'S THE
...?, COUNTING BACKWARDS

PLAY WITH: COUNTING TILL YOU GET THERE, WHAT'S THE
...?

KEY QUESTIONS AND ACTIONS:

*Is it bigger than ten?

*It's bigger than five but not bigger than
ten.

*Is it less than five?

*Is it bigger than a hundred?

*Is it even?

*Let me see if you have the 47 written on a
piece of paper.

*The biggest obstacle to success is permit-
ting the maximum number to be too large.

GOOD AND CHALLENGING MAXIMUMS: 10, 20, 100.

Player 1: "I'm thinking of a number."

Player 2: "Is it bigger than ten?"

Player 1: "No."

Player 2: "Is it bigger than five?"

Player 1: "Yes."

Player 2: "It's bigger than 5 but not bigger than
10. Is it 10?"

Player 1: "Yes!" Pause. "I want to do it again.
I'm thinking of a number."

Player 2: "O.K., is it bigger than 10?"

Player 1: "No."

Player 2: "Is it less than five?"

Player 1: "No."

Player 2: "It's bigger than four, but less than ten. Hmm, is it bigger than seven?"

Player 1: "Yes."

Player 2: "Is it ten?"

Player 1: "Oh. You guessed it again."

Player 1 was a young child, Player 2 an adult. Let's listen in on a game between an adult and an older child.

Player 1: "I'm thinking of a number."

Player 2: "Is it bigger than a hundred?"

Player 1: "No."

Player 2: "Is it less than fifty?"

Player 1: "Yes."

Player 2: "Is it bigger than sixty?"

Player 1: "No."

Player 2: "Ah. Is it bigger than forty?"

Player 1: "Yes."

Player 2: "Is it even?"

Player 1: "No."

Player 2: "Is it forty-three?"

Player 1: "No."

Player 2: "Is it forty-nine?"

Player 1: "No."

Player 2: "Is it bigger than forty-one?"

Player 1: "No."

Player 2: "Is it forty-seven?"

Player 1: "Yes," showing Player 2 the number 47 written on a piece of paper.

Children may forget the information their questions have obtained. They may not ask questions which will gain any or the most information, but, they will have fun playing the game if the numbers are small enough and if they achieve some success in guessing the numbers.

They should be learning the words and phrases: is greater than, is less than, even, and odd. They should be becoming familiar with each number's size relative to the size of other numbers.

The biggest obstacle to success with I'M THINKING OF A NUMBER is permitting the maximum number, or upper limit, in the game to be too large a number. With the very young, ten is a good and challenging maximum. I would not recommend playing this game at all with children who are not thoroughly familiar

with the numbers one through ten and their relative sizes.

With a slightly more advanced child, twenty is a good maximum. The next maximum might be 100. Children should have played COUNTING TILL YOU GET THERE through 100 many times before the maximum of 100 is attempted.

Children should continue COUNTING TILL YOU GET THERE through 200 and 300 before playing I'M THINKING OF A NUMBER with numbers greater than 100.

Very few kindergartners are really ready for maximum numbers greater than 100. Children may think they are ready for the larger numbers but, are probably not. Don't agree to playing the game unless you feel the maximum number is appropriate.

If you do play this game with a child who can write numbers, please have the chooser, Player 1, write down the chosen number. If the child cannot write down the number, play anyway and hope the child will remember the number he or she has chosen.

CARD GAMES

Even adults enjoy playing card games.

You may remember playing these games or ones similar to them as a child. Yet you may not have realized the mathematic or arithmetic practice that they provided.

SUMTHING ELSE provides practice in addition or, for the very young child, number recognition. WAR reinforces order relationships and the fact that one number is less than, is greater than, or is equal to another number. BEAT THE TENS and FOR 2, 3, OR 4 and DONE emphasize addition, subtraction, and number families.

These games may be learned by children and played without adult supervision. They may be learned by the young child and extended or added to as the child becomes older. Either way, they provide fun and rich learning experiences and opportunities.

SUMTHING ELSE

SUMTHING ELSE

TOPIC and LEVEL: Addition/Subtraction: B, I, A
Families: B, I, A

PLAY AFTER: SHOW ME, STONES ON MY LEGS, HOW MANY IS ?

PLAY WITH: STONES ON MY LEGS, HOW MANY IS ?

EQUIPMENT: deck of bridge cards changed as follows:

*Select the family from 1 to 11 which you would like to drill.

*Use all cards less than your chosen number family selected above. Use all four suits.

TO WIN: Find more pairs of cards totaling the chosen number than any other player has found.

TO PLAY: *Shuffle the deck and place all cards face-down in rows and columns.

*Players alternate turning over 2 cards at a time, trying to find a pair whose sum is the number chosen above. Example: You have chosen the 8 family. Because $2 + 6 = 8$, 2 and 6 is a winning pair.

*If no winning pair is found, the cards are simply turned over in their original places, again forming a rectangular array of face-down cards and the next player goes.

*If a winning pair is found, the player takes an other turn, and continues taking turns until no winning pair is found.

ADVANCED PLAY:

*Match both cards of the same color. (for example, 4 of hearts and 4 of diamonds)

*Match numerals and objects. (For this one needs to make a deck containing only numerals and pictures of groups of these numbers of things.)

*Match words and numerals. Create a new deck of cards.

On the table are 28 cards placed face down in neat rows. The Child has a small piece of paper on which has been written: 8, followed by a column of equations. The Adult has a newspaper.

The Child: "I want to go first."

The Adult: "O.K."

The Child turns over a card and finds the 4 of hearts; turns over another card and finds the 4 of spades; announces, "Look, I got a pair just like that. I go again;" removes the two cards from the rows and uses them to make a pile of cards on the table.

8

$$1 + 7 = 8$$

$$2 + 6 = 8$$

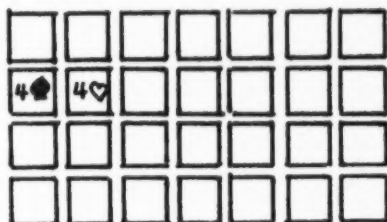
$$3 + 5 = 8$$

$$4 + 4 = 8$$

$$5 + 3 = 8$$

$$6 + 2 = 8$$

$$7 + 1 = 8$$



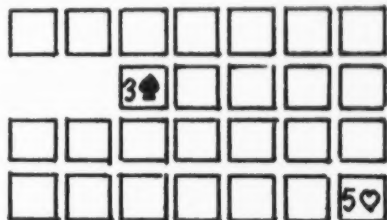
The Child turns over the 3 of spades and the 2 of diamonds; looks at the list of equations; and while returning the cards to their original arrangement, announces, "Your turn."

The Adult, who has been paying some attention to what the Child has been doing, turns over a 5 of hearts and asks, "Where is that 3?"

The Child giggles and responds, "I know, I know, but I'm not going to tell you."

The Adult turns over a 2 of clubs, the card just to the right of the 3 of spades, says, "Oh," and turns the card face down saying, "Your turn."

The Child quickly turns over the 3 of spades but



pauses to think before turning over the 5 of hearts. "I got another one. I think I'm going to win this game."

The Adult and Child have been playing SUMTHING ELSE. On the table are the ace, 2, 3, 4, 5, 6, and 7 of each of the four suits of playing cards. To win the game a player must find more pairs of numbers totaling eight than the other players find.

Players take turns turning over two cards at a time looking for pairs totaling eight. If a pair is found, the player goes again.

This is a good game for a child to play because it teaches addition and if a child pays attention, he or she has a good chance of winning-- particularly if the adult players are not paying much attention to the game.

SUMTHING ELSE can be made more difficult by using more cards and larger sums or it can be made easier by using fewer cards and smaller sums. Pairs may be made using characteristics other than addition. For example: A pair of fours may make a match if a pair of fives and also a pair of sixes also make matches. The game may also be played using homemade or commercially available decks of cards. These matches might include pairs in either of the following examples.



11	10
1+10=11	1+9=10
2+9=11	2+8=10
3+8=11	3+7=10
4+7=11	4+6=10
5+6=11	5+5=10
6+5=11	6+4=10
7+4=11	7+3=10
8+3=11	8+2=10
9+2=11	9+1=10
10+1=11	
5	8
1+4=5	7+1=8
2+3=5	6+2=8
3+2=5	5+3=8
4+1=5	4+4=8
	3+5=8
	2+6=8
	1+7=8

For the child who is just beginning to add to play the game of SUMTHING ELSE, as illustrated above, some means of checking addition is necessary. A calculator or an addition table might be used. I suggest one of the lists of equations shown here. A sheet of typing paper may be folded as indicated by the dashed lines. The paper may then be folded, as on the previous page, to expose only the addition family whose sum is being used in your particular game.

WAR

WAR

TOPIC and LEVEL: Order: B, I

PLAY AFTER: HOW MANY WOULD YOU LIKE?,
COUNTING TILL YOU GET THERE

PLAY WITH: HOW MANY WOULD YOU LIKE?,
COUNTING TILL YOU GET THERE

EQUIPMENT: a deck of bridge cards which may contain
the royals.

TO PLAY: *Shuffle and deal entire deck to players.

*Each player simultaneously turns over her
top card. The player with the highest card wins
all cards on the table and adds them to the
bottom of the player's deck.

*If two or more players have the highest
card, each places 3 additional cards face-down on
the table and 1 card face-up on the table. Player
with highest face-up card takes all cards on the
table.

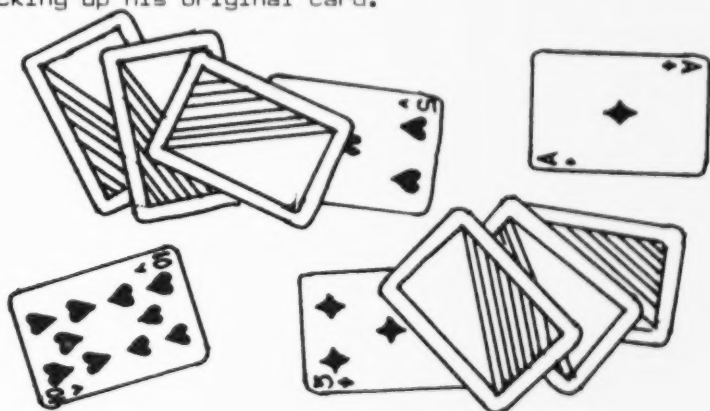
*Play continues until there is a winner or
until a time limit is reached.

TO WIN: obtain all cards.

Yes, this is the same game you played as a child.
The goal is to capture all the cards belonging to all
your opponents. The game is an excellent opportunity
for a child to see at the same time, a number of
things and the numeral for that number of things.
The property of order is stressed. The child is able
to use an "adults" deck of cards, and no player has a
mathematical advantage over other players.

Shuffle a deck of bridge cards leaving out the jokers, and the face cards if desired. Deal the entire deck to the players making sure all cards are dealt face-down. Cards should remain face-down and in each player's stack or deck as dealt until played. Each player turns over the top card on his own deck and lays it face-up in the center of the table. The player having the highest card, wins all the cards in the center of the table. These cards should be placed face-down on the bottom of his deck. The ace is played as a 1. I would remove the face cards when playing with a very young child.

If two or more players turn over the same card, for example a five of hearts and a five of diamonds, they are at war. They do battle for ownership of all cards now on the playing table. Each warring player places his top three cards face-down on the table, backing up his original card.



The deciding factor is the fourth card which each warring player places face-up on the table. The player having the highest card is the victor and captures all the cards played.

Play continues until one player captures all 52 cards or until players agree to stop. This game may go on for longer than a young child cares to play so be careful not to bore the child. A time limit might be set before play begins. Once a player has lost all his cards, he is out of the game. If a warring

player cannot supply the four additional cards needed to wage the war, he is out.

Since the adult's ultimate goals are to help the child learn and to enjoy play together, it's a consolation to know that even though the young child will take a great deal of time to decide whose card has the greatest value, this length of time will decrease as play continues and the child grows older. Permit time for the child to determine the winner of each hand, if possible. If not, help the child make the decision or be sure the child understands which card is the greatest.

War is not just a game for two people. It is a lovely, playable game for three people. Think of the kind of problem generated when three people play: Which number is the biggest: four, three, or seven?

When a child is stuck on a play, trying to determine the greater of six and seven, for example, permit the child more time to answer or suggest that he or she count the number of diamonds, spades, hearts, or clubs in the center of the card.

BEAT THE TENS

BEAT THE TENS

TOPIC and LEVEL: Counting: A

Addition/Subtraction: I, A

Families: I, A

Problem Solving: I, A

PLAY AFTER: SUMTHING ELSE

PLAY WITH: SUMTHING ELSE

EQUIPMENT: A deck of 40 cards: 4 suits, ace - 10.

TO WIN: Find more pairs totaling 10 than sets of 4 cards with no pairs totaling 10.

TO END: All 10s are uncovered.

TO PLAY: *Shuffle deck. Deal 4 cards face-up in a row.

*If a 10 is uncovered, remove it and use it as a counter.

*Fill vacant spaces with cards from deck.

*If a pair of cards totaling 10 is found, remove it and count it as one earned point.

*If no pair of cards totaling 10 is found in the set of 4 face-up cards, remove the set of 4, counting them as 1 lost point.

TO TIE: Number of points earned equals the number of points lost.

TO LOSE: Number of points earned is less than the number of points lost.

This is a game of solitaire. Remove the face cards from a deck of bridge cards leaving the BEAT THE TENS deck-- four suits of ace through 10.

Shuffle. Deal four cards face-up in a row.

If at any time, a ten turns up, remove it from the row of cards and place it face-up to the side as a counter. Fill each vacant space with a card from the undealt deck. When all four tens surface, the game ends even if more cards are to be played.

If at any time, two face-up cards are found whose sum is ten, remove the pair from the row of cards placing the pair face-up to the side to be counted as one earned point. Fill in the vacant spaces with cards from the undealt deck.

If at any time, the four up-turned cards cannot be used to make a pair totalling ten, remove all four face-up cards and place them to the side to be counted as one lost point. These cards may be placed face-down. Fill the vacant spaces with cards from the undealt deck. A set of losing cards may be crossed with a pair of winning cards to make a cross equaling zero points.

TO WIN THE GAME, THE NUMBER OF POINTS YOU EARN MUST EXCEED THE NUMBER OF POINTS YOU LOSE. If the number of points earned equals the number of points lost, you have tied; if it is less than the number of points lost, you have lost the game.

A child who is experienced in SUMTHING ELSE, pairing to ten version, is ready to play this game. I suggest the adult handles the cards until the child requests the job.

Coaching is permitted. When asked, "Do you see any (pair totaling ten)?", please respond. If you see a pair and the child does not, point to one of the cards in the pair and silently wait. Attempt to verbally interact only when requested to do so.

FOR 2, 3, OR 4

FOR 2, 3, OR 4

TOPIC and LEVEL: Counting: A
Addition/Subtraction: A
Families: A
Problem Solving: A

PLAY AFTER: SUMTHING ELSE, BEAT THE TENS

PLAY WITH: SUMTHING ELSE, BEAT THE TENS

EQUIPMENT: Deck of 40 cards: 4 suits, ace - 10

TO WIN: Be the highest scorer.

Earn a point for each family of 3 cards related by addition or subtraction.

To Play: *Shuffle deck, deal 5 cards to each player, place remaining cards in a draw pile.

*Players in turn draw from the draw pile or top of discard pile attempting to make families and go out.

*If all of a player's cards are used to make families, the round ends.

*If cards remain in a player's hand after attempting to make families, 1 card is discarded.

TO END THE GAME:

* 2 players: a player scores 10 or more points.

* 3, 4 players: a player scores 5 or more points.

DONE

TOPIC and LEVEL: Counting: A
Addition/Subtraction: A
Families: A
Problem Solving: A

PLAY AFTER: SUMTHING ELSE, BEAT THE TENS

PLAY WITH: SUMTHING ELSE, BEAT THE TENS, FOR 2,3,OR 4

EQUIPMENT: Deck of 40 cards; 4 suits of ace-10

TO WIN: Be the first player to discard all cards.

TO PLAY: *Shuffle deck; place all cards in draw pile.

*Players alternately draw a card, attempt to form a family, discard each family, announce, "Done" when turn is completed.

These two rummy games are the most advanced games in the first three sections. They should be played only after considerable work with different number families and with addition or subtraction has been completed. Games which provide background for them are SUMTHING ELSE and BEAT THE TENS.

Each game uses a deck of forty cards: four suits of ace through 10.

The goal in each is to make families of three cards which then either earn points or are discarded depending on the game.

To make a family, find three cards whose numbers are related by addition or subtraction. For example:

5, 5, and 10 are a family because

$$10 - 5 = 5 \text{ or } 5 + 5 = 10;$$

7, 2, and 9 are a family because

$$7 + 2 = 9 \text{ or } 9 - 2 = 7 \text{ or}$$

$$9 - 7 = 2 \text{ or } 2 + 7 = 9.$$

Families have exactly three members.

For 2, 3, OR 4, shuffle the deck, deal 5 cards to each player and place the remaining cards face down in a draw pile.

The player to the dealer's left draws a card from the draw pile so that six cards are now in the player's hand. If using these six cards, the player can form two families, she lays them on the table, earns two points, and the round ends. If the player can form only 1 family, she places it on the table, earns one point and discards one card. If she is not able to form a family, she just discards one card. Play passes to the player on her left who attempts to form families and use all cards.

When a player is able to use all his cards to form families, he has no cards left in his hand and goes out ending the round. This player becomes the dealer for the next round. Games with three or four players end when a player has earned a total of five or more points. The high scorer wins.

The game DONE takes its name from the sound, "Done. Done. Done. Done," which is heard when the game is played.

The deck is shuffled and all cards are placed face-down in a pile. Players alternate each drawing a card, looking for a family, and saying, "Done,"

when the searching or discarding is completed. When a player forms a family, it is discarded. No other cards are ever discarded. The first player to discard all cards is the winner.

I am indebted to Ronald Ruemmler for his help in refining these games.

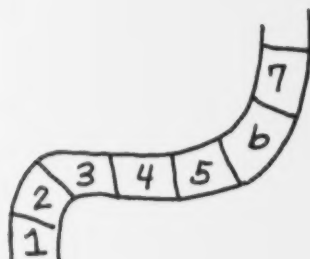
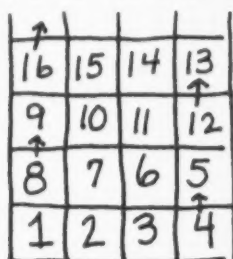
WHAT DO YOU GIVE TO THE CHILD WHO HAS EVERYTHING?

What DO you give to the child who has everything? You give something of yourself. Make the child a gift. Make it special to the child by making it relevant to his or her life or likes.

A child of two or three may not appreciate a gift which has been made and handed to the child but this same child may appreciate the making of the gift if the child is a part of the creating process. A child of four might, on the other hand, find the playing of a gift game the greater part of the gift. If you do make the game with the child's help, consider scheduling its construction so the game is completed before the special gift-giving day.

Here are the tactics you'll want to know to make the most of your time. Make a personal commitment to play the game at least a few times with the child. Keep the game simple. Include in the game some things or ideas important to the child. Color, pictures, and texture enhance a game greatly.

There are certain qualities a board game for a young child should have. If you choose to number spaces on a board, to reinforce the idea that numbers are sequential, let there be only one sequence of numbers to follow.



The board on the left does not have the path clearly marked. The board on the right does. For a

young child, I prefer the one on the right. For a slightly older child, one who is familiar or knowledgeable about numerals and numbers, I might consider using this forked board because the child might then be asked which path to follow.

By creating more than one path to follow an interesting and often enjoyable addition to a playing board is made. Consider making one path substantially longer than another but with more interesting illustrations.



The random number generator used can make or break a game. Dice (or for the younger child, a die) make a very adult and desirable number generator.

One might also use a paper plate with a paper clip spinner attached by a brass fastener as a marvelous number generator. If you choose the latter, consider the spinners below.



paper plate spinner

different ways of using the



spinner



Some of these introduce the idea that events are not always fairly distributed--an important mathematical concept.

The type of material used to create the board may make a difference to you or to the child. Typing paper is certainly a good choice. If dittoed, games may be played by a child once in a classroom and then kept as a souvenir.

Oak tag and cardboard are good surfaces for draw-

ing upon and stand up well with repeated use. Plastic wallpaper and window shades make very durable and illustrateable boards.

The playing piece used to mark a player's location is also very important to the young child. Children are fascinated by small adult items such as thimbles, small keys, coins, erasers, and cuff links and by toys such as model cars.

Illustrate your boards with adult-drawn pictures, child-drawn pictures, stickers or pictures cut from magazines.

Be creative: enjoy making and playing with YOUR game.

FORWARD-BACKWARD

FORWARD-BACKWARD

TOPIC and LEVEL: Counting: B

Order: B, I

PLAY AFTER: HOW MANY WOULD YOU LIKE?,
COUNTING TILL YOU GET THERE

PLAY WITH: HOW MANY WOULD YOU LIKE?, COUNTING TILL
YOU GET THERE, COUNTING BACKWARDS

EQUIPMENT: Spinner, board with numbers 1-10

TO WIN: Be the first player to cross home.

TO PLAY: *Spin spinner and move accordingly.

ADVANCED PLAY: * Use a board with 20 spaces.

* Let winner be the first player to land
exactly on home.

*Use backward as well as forward moves as
generated by a spinner or the flip of a coin.

*Increase board length to 30 or more.

FORWARD illustrates some of the ideas discussed in WHAT DO YOU GIVE TO THE CHILD WHO HAS EVERYTHING, namely, make the game simple, keep numbers sequential, illustrate the board, and consider involving the child in the construction of the game.

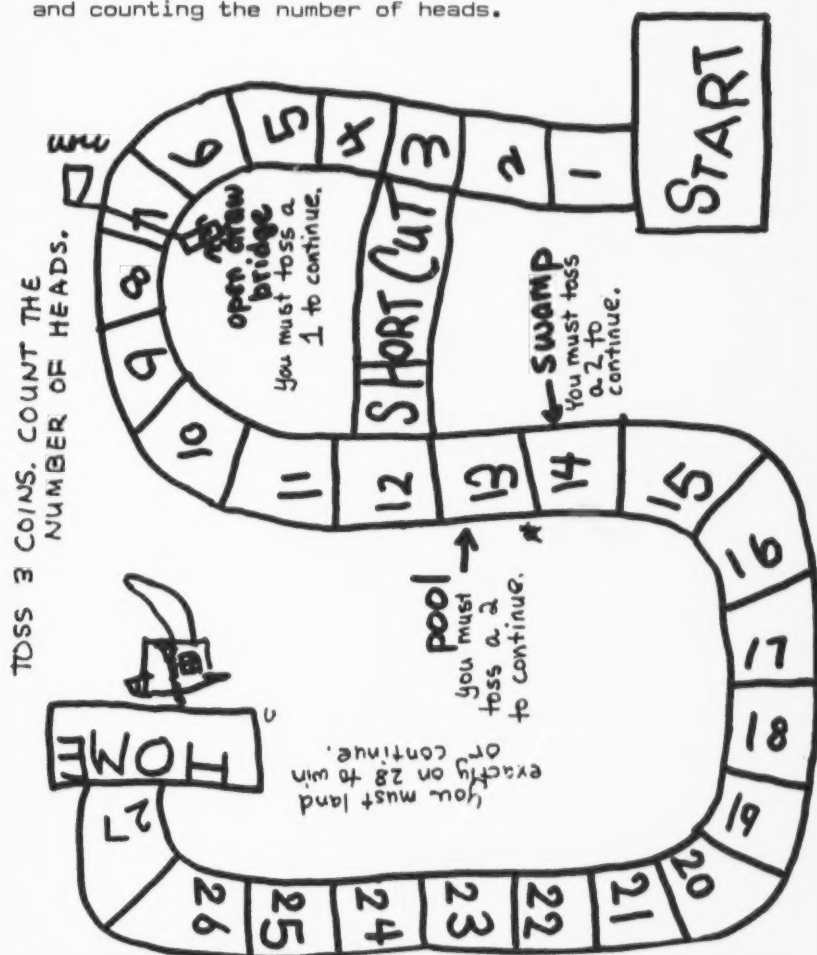
The goal in any level of play is to be the player to first move the playing piece from start to home. With the youngest child, use a board with spaces numbered 1 through 10. Use a die or a spinner with the numbers 1, 2, 3 equally spaced on the spinner or with 1, 1, 2, and 3 equally spaced on the spinner. If a player spins more than the number needed to reach home, let her go through home and win.

When playing this or any other board game with a very young child, the adult must do almost all, if

not all, the work. A child does learn by observing so the effort is well spent. Have the child complete any form of play as soon as possible.

A slightly more sophisticated game is made by increasing the spaces from 10 to 20 or by demanding a player spin exactly the number needed to reach home.

If the length of the board is increased to more than twenty, the random number generator, spinner, or die should also generate larger numbers of booby-traps should be introduced in order for the board not to become boring. The game below shows booby-traps and demands moves generated by tossing three coins and counting the number of heads.



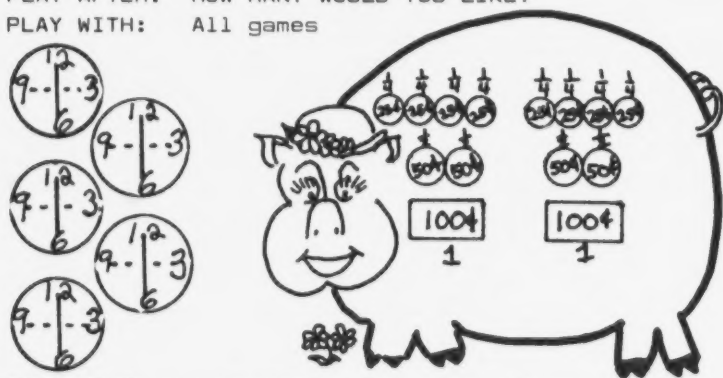
FORWARD-BACKWARD introduces backward movement and makes the game more exciting. To play use a coin and any spinner. Flip the coin, then spin the spinner. If heads, move the piece forward the number of spaces indicated on the spinner: if tails, move backward accordingly.

I suggest the use of this method with boards of short or long length. Use boards of 10 and 20 spaces to increase ease of subtraction in other games.

CLOCKS AND FILL THE BANK

CLOCKS AND FILL THE BANK

TOPIC AND LEVEL: Counting: B, I, A
 Addition/Substraction: I, A
 Order: I, A
 PLAY AFTER: HOW MANY WOULD YOU LIKE?
 PLAY WITH: All games



EQUIPMENT: A game board for each player, marking pieces, the deck of cards listed below with 7 "Gain 1/2" cards; and 4 "Gain 1" cards.

TO WIN: Be first to fill entire board.

TO PLAY: *Shuffle the deck.

*Players take turns drawing a card and filling their board as directed.

ADVANCED DECKS: *Use decks with different cards:

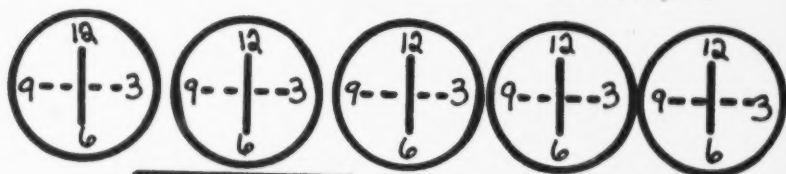
A: "Gain 1/2"	B: "Lose 1/2"
C: "Gain 1 "	D: "Lose 1 "
E: "Gain 1 1/2 "	F: "Lose 1 1/2 "
G: "Gain 2 "	H: "Lose 2 "
I: "Gain 1/4 "	J: "Lose 1/4 "
K: "Gain 3/4 "	L: "Lose 3/4 "

Level: Use Cards: Special Rules:

1	A:7, C:4	be first to fill entire board
2	A:7, B:3, C:4	be first to fill entire board
3	A:7, B:7, C:4, D:1, E:2, G:1	

If told to lose more than one has, lose turn.
 etc.

These games teach the vocabulary and addition of simple fractions. The goal in each level of both games is the same, to cover or fill the board. The cards and playing board for CLOCKS looks like the one below. One game board is needed for each player.

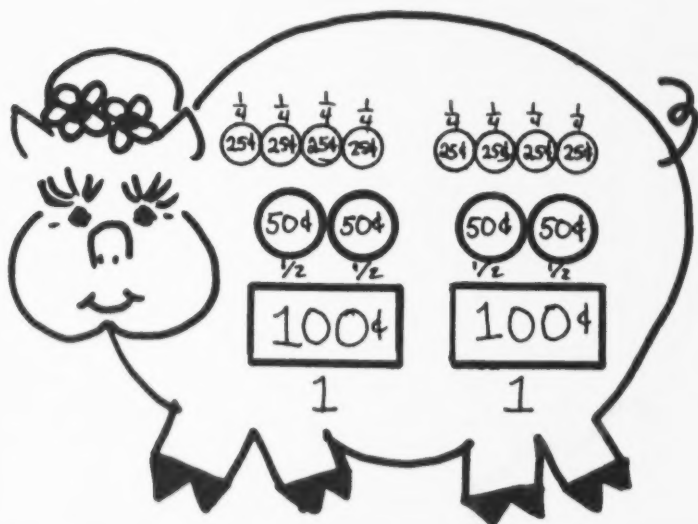


GAIN $\frac{1}{2}$ ①

The clocks are marked in either $\frac{1}{2}$ hours or $\frac{1}{4}$ hours. Use the $\frac{1}{2}$ hours for beginning play. Shuffle the deck of eleven cards, 7 "Gain $\frac{1}{2}$ " cards and 4 "Gain 1" cards and place it in a draw pile. Players in turn draw a card and fill their boards with pennies, buttons, or chips according to the cards they draw. The discard deck should be reshuffled when more cards are needed.

As with many board games, the adult does most of the work when the game is first introduced, but children quickly learn to do more of the work.

The board for FILL THE BANK is the piggy bank as shown below. The goal is to fill the bank.



BINGO

BINGO is a good game for children. When playing with adults, children feel big, and if a child is permitted to be the caller, he or she feels even bigger.

Here are some suggestions.

* Have a young, very inexperienced child be on a team with an adult. The adult can do all the work and perhaps explain the play: the child can supervise.

* Play with pieces, markers and boards large enough for the child to handle.

* If a drawn number board is not available with your BINGO set, make one and encourage the child to watch it being filled and to help fill it.

An easy way to make a board is to use magic marker on the back of a piece of heavy wallpaper or window shade. List the numbers in columns headed B, I, N, G, O. List the numbers 1 through 15 under B, the numbers 16 through 30 under I, the numbers 31 through 45 under N, the numbers 46 through 60 under G and under O, list the numbers 61 through 75. Indicate drawn numbers with milk bottle tops, pennies or the drawn marker itself.

****PERMIT THE CHILD TO BE A CALLER AND TO PLACE THE MARKERS ON THE DRAWN NUMBER BOARD !!!!!**

GAMES AND ACTIVITIES WITH OTHER THINGS

Adult tools often make excellent toys for children.

This section is designed to help you create valuable play for children you know. Mileposts, license plates, clocks, calculators, calendars, toll road receipts, measuring tapes, and juke boxes are routine to an adult but to a child each can be a marvelous new entity. Create your own games and activities with these everyday items and they may no longer seem trite or boring to you.

Before you throw away last month's page from the calendar, take a look at it. Notice, if you box off any three numbers in a row, column, or diagonal (exclusive of the spaces with no date) then multiply the middle number by three, you get the sum of all three numbers:

$$2 \times 3 = 6 = 1 + 2 + 3, \quad 14 \times 3 = 42 = 7 + 14 + 21,$$

$$12 \times 3 = 36 = 11 + 12 + 13, \quad 17 \times 3 = 51 = 9 + 17 + 25$$

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Try boxing off four or five in a row or perhaps a square of numbers. What kinds of things happen then?

As you drive down the highway make a contest to see who can find in order the numbers from one to fifty in any part of a license plate, in house num-

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

bers, or on billboards and signs. Try spotting mileposts and following the sequence as the mile numbers ascend or descend. A young child may have a great deal of difficulty even finding the numbers you point out before they are out of the field of a view of a moving car. Wait until the child is kindergarten age and has developed better eyesight and counting skills.

Examine with your child things such as flowers, starfish, wheels and star shapes focusing on their radial symmetry.

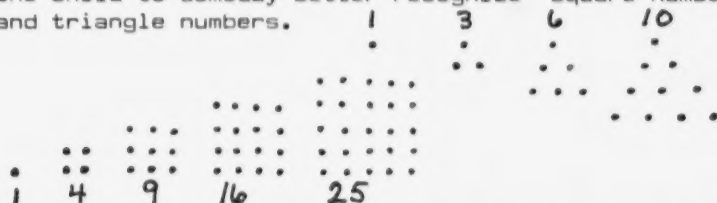


Do this with humans, face, butterflies, and maple leaves focusing on their bilateral or line symmetry.



I am not suggesting that you use the terms radial and bilateral with the young children, but some may be ready to hear the words. The words are not as important as the idea of being balanced in a certain way. Show the children in your world the beauty and balance around them.

Count the number of objects it takes to form a triangle or square array of things. This prepares the child to someday better recognize square numbers and triangle numbers.



Teach the children in your world to see the patterns about them. If you acknowledge and enjoy mathematics in the world around you, your child will learn to do the same.

WHAT WOULD YOU LIKE TO BUY?

WHAT WOULD YOU LIKE TO BUY?

TOPIC AND LEVEL: Counting: A

Addition/Subtraction: I, A

Problem Solving: I, A

PLAY AFTER: HOW MANY WOULD YOU LIKE, SHOW ME WITH COINS

PLAY WITH: HOW MANY WOULD YOU LIKE, SHOW ME WITH COINS, COUNTING BY...

EQUIPMENT: Play money, toys, things, or pictures with price tags

TO PLAY: Sell and purchase the items.

ADVANCED PLAY: *Make change for large bills

*Use larger prices

*purchase more items in each sale

WHAT WOULD YOU LIKE TO BUY? requires toys--things the child owns or with which the child plays. Determine a cost for each item and then label the items with their prices. Magazines pictures and drawings may also be used.

The adult should purchase an item or some items from the child and pay for the purchase using play money. Roles may with experience be reversed.

If using both pennies and nickels, play should have been preceded at least by SHOW ME (WITH COINS), otherwise, HOW MANY WOULD YOU LIKE? and SHOW ME are sufficient background.

Initial purchases should be of only one item. As experience is gained, more items and/or larger values should be used. Change might be made for purchases made with large coins. FILL THE BANK provides background experience. See SHOW ME (WITH COINS) for suggestions.

THE JUKE BOX GAME

THE JUKE BOX GAME

TOPIC AND LEVEL: Counting: I, A

PLAY AFTER: HOW MANY WOULD YOU LIKE?, COUNTING TILL YOU GET THERE

PLAY WITH: COUNTING TILL YOU GET THERE

EQUIPMENT: A juke box request box

KEY QUESTIONS: *How many would you like?

*I'd like (in order of difficulty):

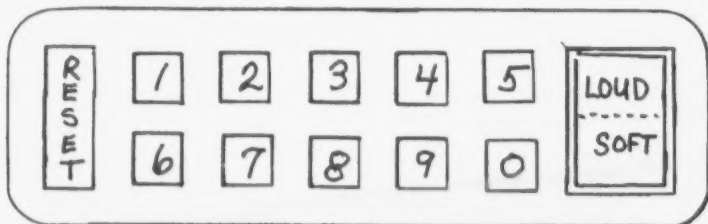
7, 15, 23, 134, 60

Michael created this game before entering kindergarten. His favorite spot at a booth in any diner was one within reach of the juke box. Button pressing was of major importance to this child.

We'd played COUNTING TILL YOU GET THERE into the hundreds numerous times and played HOW MANY WOULD YOU LIKE? at home with bottle tops, coins and model cars, so, his question, "What number would you like?" seems quite natural.

I said, "seven, please". He pressed the 7 button on the juke box and a new game was born. Agreed, it seemed very like the old HOW MANY WOULD YOU LIKE. The difference was that now the numeral 7 stood for seven rather than seven representing seven things. This was a major jump in sophistication.

Examine the board then, if you wish, listen in on



The Child: "What number would you like?"

The Adult: "5"

The Child presses the 5 button. "What number would you like?"

The Adult: "I'd like a six, Jamie."

The Child presses the 6 button. "What number would you like?"

The Adult: "I'd like a fifteen."

The Child thinks for awhile, presses the 1 and then the 5 button and responds with, "What number would you like now?"

The Adult: "Very good, Jamie! That was a hard one. Would you like a hard one or an easy one?"

The Child: "A hard one,"

The Adult slowly says, "I'd like a twelve."

The Child thinks awhile, presses the 1 then the 2 button. "What number would you like?"

The Adult: "That was great. I'd like a twenty-one, please."

The Child thinks awhile, then presses the 1 button, then the 2 button. The Child thinks awhile, and presses the LOUD/SOFT button, explaining, "I made a mistake: I have to do this. I have to erase this." The Child presses the 2 then the 1 button. "What number would you like?"

The Adult: "I'd like a twenty-four, please."

The Child presses the 2 then the 4 button. "What would you like?"

The Adult: "I'd like a twenty-seven."

The Child presses the 2 button then the 7 button and glances at the Adult for instructions.

The Adult: "I'd like a fifty-three, please".

The Child presses the 5 then the 3 button. "Now you do it. I'd like a ... seven."

The Adult presses the 7 button and looks at the Child.

The Child thinks, "I'd like a ninety-nine!"

The Adult presses the 9 button twice. "I'd like one hundred."

The Child thinks; then presses the 1 button then the 0 button twice; smiles to himself, then turns to the Adult.

The Adult: "That's very, very good. I'd like a four hundred twenty-seven. But, I'll tell you how to do it. First you need a 4."

The Child presses the 4 button.

The Adult: "Then you need a twenty-seven."

The Child presses the 2 then the 7 button and looks at the Adult.

The Adult: "That's it. That's four hundred twenty-seven. Now I'd like a very hard one. I'd like sixty."

The Child: "But I don't know that one."

The Adult: "I told you it was a hard one. You need a six then a zero."

The Child: "But I don't understand," pressing the 6 then the 0 button.

The Adult: "I know. That's O.K. You just need sixty. Not sixty-one, not sixty-two, not sixty-seven. Just sixty. Just press the 6 button then the 0 button."

The Adult realized the child didn't understand completely. That's fine. Jamie had played COUNT TILL YOU GET THERE so he had a feel for the numbers. He'd seen numbers like 15, 26, 57, and 100 in written form in FORWARD AND BACKWARD, so that he had a feel for what was going on. Jamie knew a bit more after the game then before playing the game and had a good time playing. But he'd reached a limit. That's a good time for the game to end.

MEASURING TAPE GAME

MEASURING TAPE GAME

TOPIC AND LEVEL: Counting: A

Order: I, A

Geometry: B, I, A

PLAY AFTER: COUNTING TILL YOU GET THERE, FORWARD AND
BACKWARD

PLAY WITH: All Games

EQUIPMENT: Centimeter Tape Measure

TO PLAY: 1st player states the estimated length of
the next item.

ADVANCED PLAY: Have the child record the guesses and
actual lengths.

"How long is my table, Denise?" asks almost five
year old Rosa.

Denise, the babysitter, has been doing her trigo-
nometry but gets up to read Rosa's brand new tape
measure which Rosa holds across her doll's table.

"It's forty-three centimeters long, Rosa. How
tall do you think you are?" asks the Adult, taking
the tape measure from the Child's hands.

The Child: "I'm four".

The Adult: "No. That's how old you are. This
will tell us how big, how tall you are."

The Child: "Oh."

The Adult measures and announces, "You're almost
ninety centimeters tall. See here's the number nine-
ty on your tape measure."

The Adult shifts the tape to measure the height
of the kitchen table and asks the Child, "Can you

read the number at end of the tape now?"

The Child looks and asks, "Seventy-five?"

The Adult: "Yes. Good. That means the table is seventy-five centimeters high. Try measuring this," and holds the tape to measure the distance from the floor to the seat of the kitchen chair.

The Child reads the tape and reports, "Forty-eight centneeders".

The Adult: "Good, forty-eight centimeters."

With this much measuring background and experience in COUNTING TILL YOU GET THERE and FORWARD-BACKWARD, a child is ready to guess length and measure-- to play the MEASURING TAPE GAME.

I strongly recommend the centimeter as the basic unit of measure because rounding to the nearest centimeter or half centimeter is accurate enough for a child's use. It's a real unit of measure (not like the length of a paperclip--a unit used by some textbook companies). A tape measure will have 100 centimeters on the tape before any sort of unit change--the same numbers the child has been using in other games. Customary rulers may be quite confusing.

I also suggest using a tape measure with a little metal right angle at the zero end. It makes measuring much easier.

The two important features of this game are measuring and estimating length. Emphasis and importance for the child shifts from the measuring to the estimating as the child gets older and more experienced with the game.

When you do play, guess then measure things of similar lengths so that one measurement will help in estimating the next measurement.

The measurement aspect has been illustrated above. Now, let's look at the estimation.

The Adult: "I'll guess 25 centimeters"

The Child measures her toy car and announces, "About twenty-seven and a half centimeters."

The Adult: "Your turn to guess three things. How about those books over there?"

The Child: "O.K. I think this one's about thirty-nine centimeters," and measures the red book, announcing, "forty-two centimeters. Now I'll do this dictionary," indicating a slightly longer book. "I

guess it's forty-five centimeters."

The Adult: "I'd say forty-seven centimeters. It looks longer to me."

The Child measures the dictionary and announces, "Forty-six centimeters. We were both close that time."

"This time I guess thirty-seven centimeters," indicating the smallest book.

The Adult: "Sounds good, Rosa".

The Child measures and announces, "Oh. A tiny bit more than thirty-seven."

The Child has done the measuring as well as some guessing and with the tape measure in hand has been the authority. This has been a good experience socially as well as mathematically.

A CALCULATOR GAME

A CALCULATOR GAME

TOPIC AND LEVEL: Addition/Subtraction: B, I, A

Families: B, I, A

PLAY WITH: SUMTHING ELSE, BEAT THE TENS

EQUIPMENT: A Hand Held Calculator

TO PLAY: Child enters a 1-digit number and +.

Adult enters its complement to 10.

Child enters = and 10 is displayed.

ADVANCED PLAY: *Child assumes Adult's role.

*Players play with complements to 20.

*Players play with complements to 30.

*Adult enters 1-digit number and Child enters complement.

Because of overshadowing by the microcomputer, the hand held calculator has not taken it's rightful place as an educational tool in the primary school. Numerous publications do expound upon it's usefulness in the early grades.

Its uses in the content of this publication have been limited to a computational tool or aid, an excellent one, for playing SUMTHING ELSE, BEAT THE TENS, or perhaps STONES ON MY LEGS, and as an alternate board for the JUKE BOX GAME.

Here is a game I do recommend.

The Child enters a 1-digit number, then the addition or plus sign, and hands the calculator to the Adult who has seen the Child enter the number.

The Adult enters the number's complement to 10 and hands the calculator to the child. (For example: $2 + 8$.) The Child enters the actual sign and a 10 is displayed.

To a young child this will seem like magic. A more mathematically sophisticated child will figure out what the adult has done. A child who has succeeded in playing SUMTHING ELSE probably has this game figured out and is ready to assume the Adult's roles: The Adult enters the number and the Child enters the complement.

With some adult supervision, this child might play A CALCULATOR GAME with another, younger child. TO TEACH IS TO LEARN TWICE. This child is also ready for more sophisticated totals than 10. While in first and second grade (ages 6 and 7) the child might magically use numbers through 20.

MAGIC LINE

MAGIC LINE

TOPIC AND LEVEL: Problem Solving: I, A
 Geometry: B, I, A

PLAY WITH: I WANT YOU TO DRAW....

EQUIPMENT: Paper, pencil, plastic shapes from I WANT
 YOU TO DRAW....

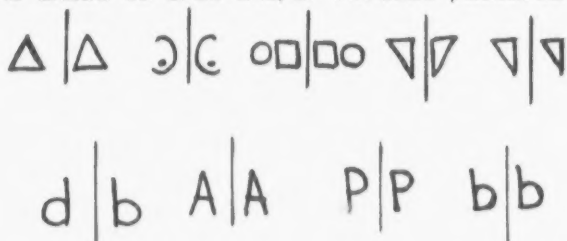
TO PLAY: *1st player draws shape, picture, letter.
 *2nd player draws its copy or its reflection.

ADVANCED PLAY: * Make and use more complicated
 pictures.

This is a geometry game giving practice in copying shapes and designs and in reflecting shapes and designs.

To play, the first player draws a letter, shape, design or simple picture on one side of a sheet of paper, a line is drawn down the middle of the paper, representing the MAGIC LINE and the second player attempts to copy the drawing or it's reflection on the other side of the line.

This game should be played before a child enters kindergarten and learns to write letters. Start by asking the child to draw and/or reflect pictures like these.



As you play this game, feel free to discuss the names and/or characteristics of the figures used. Small "d" is a reflection of small "b" -- one could also use the phrase a backward "b". Capital "A" is the same when it is reflected as when it is copied. Some triangles and rectangles look the same when reflected and some do not. Emphasize the difference between a copy and it's reflections.

As the child develops, try more complex pictures. Do not be upset when a child's drawn lines aren't straight and curves aren't smooth: drawing and copying is difficult for a child to do. The mind is ready though the hand is not. Accept pictures that are thematically correct. You might also try using the shapes on page 73 in I WANT YOU TO DRAW.... This is another game in which reversing roles is possible.

Experiment. Ask a child to draw. Try drawing the child's picture. Play.

I WANT YOU TO DRAW...

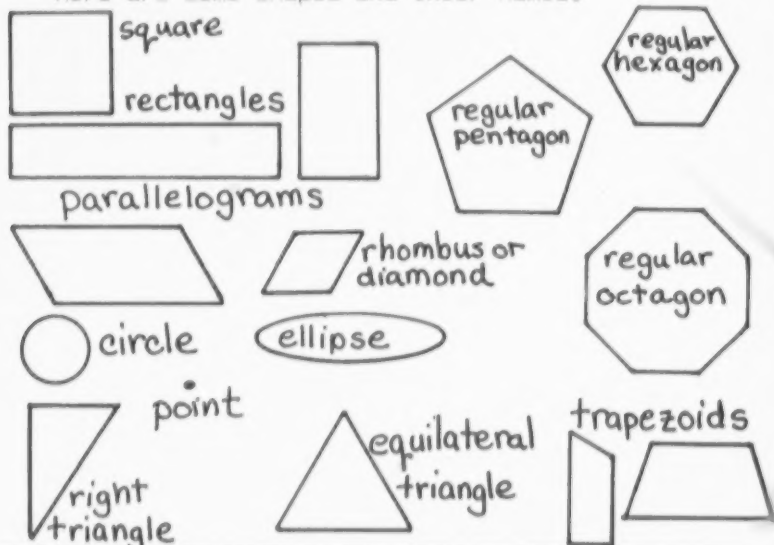
(THE GAME SUMMARY IS ON THE NEXT PAGE.)

More important to any human than the ability to do mathematics or arithmetic is the ability to communicate with another person.

This game and its variations can be played by children, except the very young, and adults of all ages. The object is simply this: To another person, describe an already drawn picture so well that he or she will be able to draw it exactly.

Before doing this with a child, it might be helpful if you, the adult were familiar with some mathematical vocabulary. I'm not suggesting that you ever use most of this vocabulary with a child, but your child may ask and you may even find your child ready to use some of it.

Here are some shapes and their names.



I WANT YOU TO DRAW...

TOPIC AND LEVEL: Geometry: B, I, A

PLAY AFTER: MAGIC LINE

PLAY WITH: MAGIC LINE, all games

EQUIPMENT: paper, pencil, and plastic figures
TO PLAY THE GAME:

- *Player 1 draws a picture using one or more shapes;
- *Player 1 keeps the picture hidden from Player 2;
- *Player 1 describes the picture to Player 2;
- *Player 2 draws the picture using only Player 1's instructions.

SOME USEFUL PHRASES AND WORDS:

on top of, to the right of, to the left of, below,
touching, inside, outside, inscribed, circumscribed

ALTERNATE VERSIONS OF THE GAME:

- *Player 1 draws a picture.
 - *Player 2 gives directions to Player 3.
 - *Player 3 tries to draw the picture.
 - *Player 1 shows the original picture to everyone.
or
 - *Player 1 draws, then gives directions to Player 2.
 - *Player 2 tries to draw the picture.
 - *Player 1 again states directions so Player 2 can
check the newly drawn picture.
 - *Player 2 changes the picture, if necessary.
 - *Player 1 shows Player 2 the original picture.
or
 - *Player 1 has a drawn picture.
 - *Player 2 asks Player 1 about the picture in order to
be able to draw it.
 - *Player 2 draws the picture.
 - *Player 1 shows Player 2 the picture.
- #### ALSO CONSIDER:
- *Should the players look at each other?
 - *Should the player giving directions look at the picture
as it is being drawn?
 - *Should the player giving directions use hand motions
in the explanation?
-

To play the game:

1. Player 1 draws a picture containing one or more

shapes.

2. Player 1 covers the picture so Player 2 can't see it.

3. Player 1 describes the picture to Player 2.

4. Player 2 draws the picture using only Player 1's instructions.

For example:

Drawn Picture	Directions	Possible Response
---------------	------------	-------------------



The Adult: "Landy, will you draw a square, please." or



The Adult: "Yolanda, will you draw a square, please."



The Adult: "That's close. A square has all sides the same size. Would you draw a square for me, please. Good, let's try a harder picture."



"There are two shapes in the picture I'm looking at. One shape is a square and the other one is a circle."



They're both about the same size. The circle is on the right. The square is on the left. They're touching each other. Please draw a picture like that."

Now it's YOUR turn to draw the picture. Get a piece of paper and get ready to draw the picture I describe.

There are three shapes: a circle, a triangle, and a long rectangle. The circle is at the top of the picture and the triangle is inside the circle, just touching the circle at its three vertices (points where two sides meet).

All the sides of the triangle are the same length. One of the vertices is at the top of the picture.

The circle is sitting on top of the rectangle and

makes the picture look a bit like a head sitting on shoulders. The circle touches the center of the top side of the rectangle. The rectangle is as wide as the circle and twice as long as the circle. The long sides of the rectangle run from left to right, and the short sides run up and down.

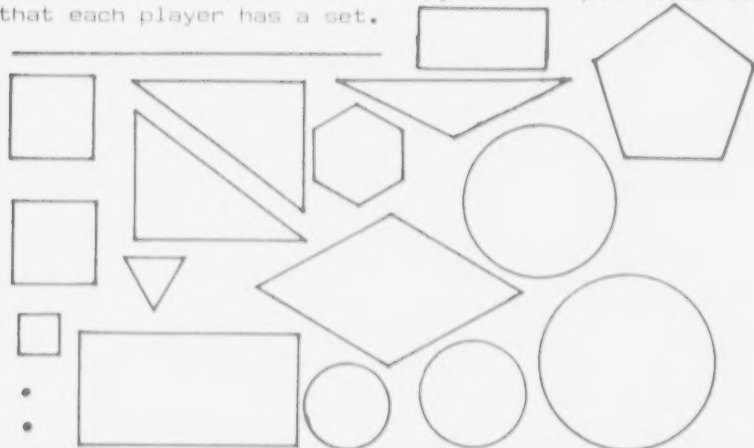
Please try to draw the picture.

The picture I tried to communicate is shown in the last figure in this section. How well did I do? How well did you do? As you tried to draw the picture, did you go back and reread what I'd written before you started to draw? Did you start drawing while reading and then need to change your picture as you read further? What were the phrases I used which confused you? Which phrases helped you the most? Could you improve the directions I gave by re-ordering the description or by using different words?

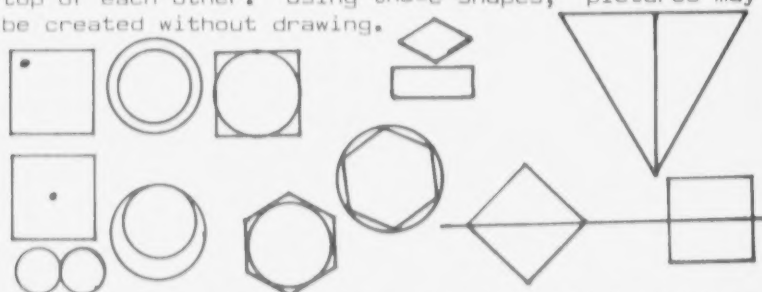
This example was meant for use with an adult or with a child who has done drawing of this nature. I think you'll be surprised and pleased by how well your child will do with this game. Children are often much better listeners than adults and can sometimes give pretty good directions.

The drawing ability of a very young child, or just young children, is not highly developed. The motor skills aren't developed though the thinking skills are developing. Here is an approach to get around this problem.

On a sheet of clear acetate, copy this set of shapes. You may wish to copy the shapes twice so that each player has a set.



Now, cut the shapes out so that you have clear plastic pieces which may be moved about or placed on top of each other. Using these shapes, pictures may be created without drawing.



Here are some words or phrases which might be useful.

On top of	To the right of	To the left of
Below	Touching	Inside
Outside	Inscribed	Circumscribed

Let's look at some different ways the game could be played. Player 1 draws a picture, hides it, gives directions to Player 2. Player 2 tries to draw the described picture. Player 1 shows Player 2 the original picture. or

Player 1 draws a picture. Player 2 gives directions to Player 3. Player 3 tries to draw the picture. Player 1 shows the original picture to everyone. or

Player 1 draws a picture and gives directions to Player 2. Player 2 tries to draw the picture. Player 1 again states directions so Player 2 can check the newly drawn picture. Player 2 changes the picture if necessary. Player 1 shows Player 2 the original picture. or

Player 1 has a drawn picture. Player 2 asks Player 1 about the picture in order to be able to draw it. Player 2 draws the picture. Player 1 shows Player 2 the picture.

I've chosen the names Player 1 and Player 2 rather than the Child and the Adult, because this is such an important game for role reversing. Both the person describing and the person drawing can learn by playing. Give each player this opportunity.

Other considerations are:

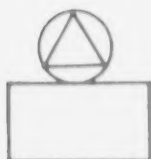
*Should the players look at each other while

playing?

*Should the player giving directions look at the picture as it is being drawn by another player?

*Should the player giving directions use hand motions in the explanation?

My preference is to say "no" to most of the above most of the time, but ONCE YOU PLAY A GAME IT BECOMES YOURS and you make the rules. Create, experiment, and ENJOY.



ACTIVITIES IN BATHTUBS

ACTIVITIES IN BATHTUBS

TOPIC and LEVEL: Counting: I

Geometry: B, A

PLAY AFTER: COUNTING TILL YOU GET THERE

PLAY WITH: COUNTING BACKWARDS and others

*Leave different size and shape cups and containers in the tub for a child to use.

*Some submerged items make good rockets for COUNTING BACKWARDS.

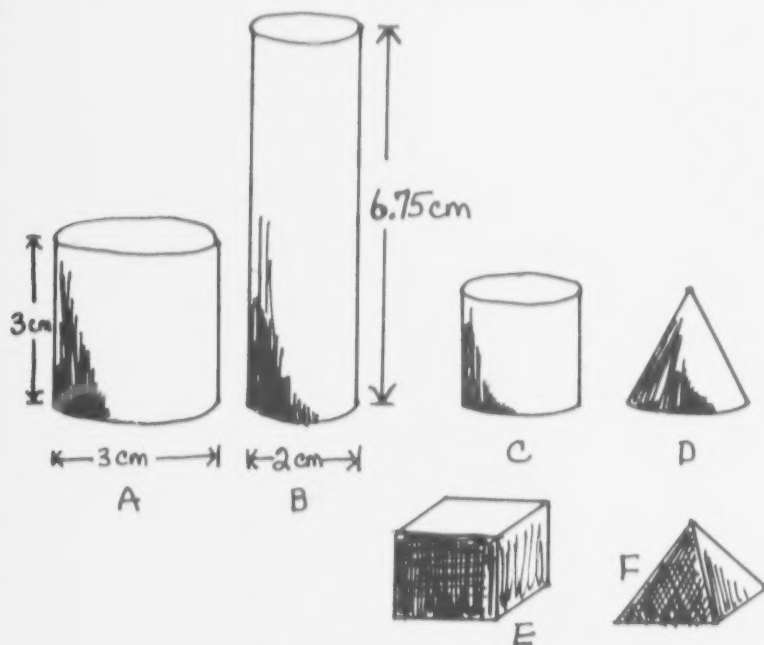
Young children are fascinated by their ability to fill and empty. Give a child a large empty cardboard box or laundry basket and it will be filled with toys, carried around, emptied, filled with toys, emptied, filled with child, and emptied.

A bathtub at home, or a watertable in school, provides the environment for more filling and emptying activities.

Given two cups of the same size and a tub of water, many young children will quite happily fill and empty the cups pouring water from one cup to the other or into the tub. A somewhat older child still enjoys filling and emptying but not if the cups hold the same amount. Play should now be with cups and containers of various sizes and shapes.

It's fun to watch water from a large cup overflow when poured into a smaller cup. It's necessary to use more than one small cup of water to fill the larger cup. This play is beginning experiments with volume.

To many people, container A looks smaller than container B. In fact, they have the same capacity. Container C contains three times that of container D. Container E contains three times that of F.



Adults have learned to question the capacity of containers; many children haven't had the experiences to do this. Leave different size and shape containers in with bathtub toys, just so a child may make volume experiments and discoveries. Provide the tools, not the instruction.

The bathtub also provides a great launch pad for COUNTING BACKWARDS. If a container of trapped air is submerged in water and then released, it will pop to the surface. (The deeper it is submerged, the more likely it is to shoot out of the water.) To play COUNTING BACKWARDS, a small container is submerged and a countdown is conducted till the object's released. For example:

ADULT: "Captain Megan, all systems are go.

We're ready for a countdown."

CHILD: "Roger. I'll do the countdown. Three, two, one...."

ADULT AND CHILD: "Blastoff!!!!!!!" (Megan, age three releases her submerged "rocketship".)

CHILD: "Play with me again. Play with me again."

ADULT: "Captain Megan, all systems are go. Ready for the countdown."

CHILD: "Three, two, one..."

ADULT and CHILD: "Blastoff!!!!!"

CHILD: "Again, again, but bigger. Make it bigger!"

ADULT: "Do you want a longer count down???!"

CHILD: "Yes, longer."

ADULT: "O.K., I'll do the countdown. Ten, nine, eight, seven, six, five, four, three, two, one..."

ADULT and CHILD: "Blastoff"

CHILD: "Again."

ADULT: "Ten, nine, eight, seven,....., one..."

ADULT and CHILD: "Blastoff!!!!!!!"

TOPIC & LEVEL CHART

GAME	COUNTING,	ADDITION/SUBTRACTION
How Many Would You Like?	B	
Counting Till You Get There	B, I	
Show Me	B, I, A	
Show Me With Coins	A	A
Counting By...	I, A	
Counting Backwards	I, A	
Stones on My Legs	A	B, I
How Much is...?	I, A	
What Comes After/What Comes Before	A	
What's The....?	A	
I'm Thinking Of A Number		
Sumthing Else		B, I, A
War		
Beat The Tens	A	I, A
Done; For 2, 3, or 4		A
Forward and Backward	B	
Clocks; Fill The Blank	B, I, A	I, A
Bingo	I	
What Would You Like to Buy ?	A	I, A
Juke Box Game	I, A	
Measuring Tape Game	A	
A Calculator Game		B, I, A
Magic Line		
I Want You to Draw....		
Activities In Bathtubs	I	
B=Basic I=Intermediate A=Advanced		

NUMBER FAMILIES, ORDER, PROBLEM SOLVING, GEOMETRY

I	I, A		
	A		
	A	A	
B, I, A			
	B, I		
I, A		I	
A			
	B, I		
	I, A		
	I		
		I, A	
	I, A		B, I, A
B, I, A,			
		I, A	B, I, A
			B, I, A
			B, A

Games to Play After and With

GAME

1. How Many Would You Like
2. Counting Till You Get There
3. Show Me
4. Show Me With Coins
5. Counting By...
6. Counting Backwards
7. Stones On My Legs
8. How Many Is.....?
9. What Comes After/What Comes Before
10. What's The?
11. I'm Thinking Of A Number
12. Sumthing Else
13. War
14. Beat The Tens
15. Done; For 2,3, or 4
16. Forward and Backward
17. Clocks and Fill The Bank
18. Bingo
19. What Would You Like To Buy
20. Juke Box Game
21. Measuring Tape Game
22. A Calculator Game
23. Magic Mirror
24. I Want You To Draw....
25. Activities in Bathtubs

NOTICE: THE NUMBERS ARE LISTED AT THE

AFTER	WITH
	2
1	1
1	7, 19
1, 5	7, 5, 19
2	2, 6
2	2, 5
1, 3	3
1, 3, 7	7
2, 6	2, 6
2, 5, 6, 9	5, 6, 9, 11
2, 10, 5	2, 10
3, 7, 8	7, 8
1, 2	1, 2
12	12
12, 14	12, 14, 15
1, 2	1, 26
1	all
2	2
1, 4	1, 4, 5
1, 2	2
2, 16	all
3, 12	12, 14
24	
23	23
2	6 and others

LEFT IN THE COLUMNS ABOVE.